BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 7 1940

NON-PENETRATING INJURIES OF THE HEART

BY

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Although it has been recognized since the days of Hippocrates that penetrating wounds of the heart are usually fatal little has been written in the medical literature about the effects of non-penetrating injuries. The reports that have appeared have consisted almost entirely of anatomical descriptions of injuries of the heart found at necropsy. Until about five years ago the possibility that such trauma could produce functional or organic changes in the heart which were not necessarily fatal had been almost completely ignored. Bright and Beck (1935) collected from the literature since 1826 records of 168 cases of non-penetrating heart injury. Of these 156 were fatal, death in all but four being due to rupture of the heart. From these figures it might be assumed that recovery is a rare event, but that this conclusion would be fallacious is suggested by animal experiments carried out by the same authors. In twenty-five dogs the hearts were exposed and traumatized. Only five of the dogs died—one of rupture of the heart, two of ventricular fibrillation at the time of the trauma, and two of myocardial failure, one a few hours afterwards, and the other on the following day. From these experiments it appears that the heart can tolerate a great deal of trauma and that rupture is a rare event. The authors conclude that the vast majority of non-penetrating wounds of the heart are not recognized clinically, the explanation undoubtedly being that the possibility is not considered, especially if, as is usually the case, the patient is in a surgical ward on account of other injuries. Since correct treatment may prevent rupture of the heart during the days or weeks following an injury, and since minor degrees of injury may be followed by prolonged or permanent incapacity, early diagnosis of this condition is not unimportant. Chest injuries are common in civilian practice and will become more common in wartime. It is interesting that during the war of 1914–18, when chest injuries must have been numerous, only one case of non-penetrating injury of the heart was reported (Déjerine and Gascuel, 1914). Cardiac symptoms following a chest injury may be the grounds for a claim for compensation and may wrongly be ascribed to cardiac neurosis. For these reasons it is imperative that in every case in which symptoms of circulatory embarrassment follow an injury to the chest the possibility of cardiac involvement should be carefully considered. The presence of such an involvement may be quite obvious, or it may necessitate a thorough clinical investigation, with radiological and, most important of all, electrocardiographic examinations. The fact that cardiac symptoms do not follow immediately on the injury does not necessarily exclude the possibility of traumatic heart disease. Out of fifty-one cases collected by Warburg (1938) in which injury to the heart was proved by post-mortem examination there was a latent period after the accident in fifteen cases. This latent period varied from two days to as long as eighteen years.

It has usually been considered that the heart, enclosed in its bony cage, is well protected from injury. Yet such is the resilience of the ribs, especially in the young, that there can be sufficient distortion of the thorax to injure the heart without fracture of the ribs or sternum. In the published cases fracture of the ribs is the exception rather than the rule. Moreover, a portion of the heart lies in a very vulnerable position, between the sternum anteriorly and the bodies of the vertebrae posteriorly. Anteroposterior compression of the thorax or a severe blow on the sternum may compress the heart between these bony structures and rupture it.

Morbid Anatomy

Lesions of Pericardium.—In Warburg's (1938) series of sixty cases of subacute and chronic traumatic heart disease which came to necropsy fibrinous pericarditis was found in seven and purulent pericarditis in five. Adherent pericardium was observed in a child who died six months after the trauma. Warburg describes a case of his own which developed Pick's disease with calcifications in the pericardium two years after the injury. Clinically, pericardial friction has often been reported, this sign first being noted at periods varying from a few hours to a month after the injury. It seems not unreasonable to suggest that the milk spots seen so often on the pericardium may result from localized patches of fibrinous pericarditis following mild degrees of trauma. Haemopericardium is found when the heart wall has ruptured. Bright and Beck (1935) reported that a blood-stained pericardial effusion developed in half their experiments in which the exposed hearts of dogs were traumatized.

Lesions of Myocardium.—The injury may lead to immediate rupture of the heart or to contusion of the heart wall —that is, tearing of a few fibres with haemorrhage into the middle of the wall or under the endocardium or pericardium. The rent may involve the endocardium and extend part of the way through the myocardium. Contusion tends to be followed by softening of the area involved, producing a lesion closely resembling a cardiac infarct, and, as in the case of a cardiac infarct, this softened area may give way. The softening appears to reach its maximum during the second week after the injury, for it has been found that if the patient survives the first few hours this is the period during which rupture is most likely to occur (Bright and Beck, 1935). Should the patient survive the first few weeks the area of contusion becomes stronger owing to the development of scar tissue. This scar tissue may stretch, and the formation of a cardiac aneurysm has been described by Vaquez (1928) some months after the trauma and by Joachim and Mays (1927) thirteen years afterwards.

The frequency with which the various parts of the heart wall tend to be ruptured is shown in an analysis

by Bright and Beck (1935) of 152 cases, which gave the following results: left ventricle thirty-seven, right auricle thirty-six, right ventricle thirty-one, left auricle thirty, more than one chamber thirteen, interventricular septum eleven, interauricular septum one. As regards vulnerability there is therefore no striking difference between the four chambers of the heart.

Lesions of Endocardium.—Small subendocardial haemorrhages are often found in experimental animals which survive trauma to the heart. Rupture of valves and tearing of chordae tendineae or papillary muscles did not occur in any of thirty-two dogs whose hearts were exposed and injured by blows (Moritz and Atkins, 1938). Rupture of a healthy valve in a human being appears to be a very rare event. Theoretically it is possible that a small tear or contusion of the valve might heal, and in so doing lead to stenosis of the valve. A well-authenticated case in which mitral stenosis developed in this way is described by Barber (1938).

From the experimental studies of Schlomka (1934) and of Bright and Beck (1935), and from the case reports which have been mainly studied by Bright and Beck (1935) and Warburg (1938), the following clinical picture of non-penetrating heart injury can be built up.

Initial Symptoms of Heart Injury

The blow may be almost immediately fatal as a result of ventricular fibrillation or a large tear in the wall of the heart. In cases which are not rapidly fatal the blow is, as a rule, immediately followed by a transient state of collapse which may be due to the cardiac contusion or to shock or to the emotional effect of the accident. Loss of consciousness is unusual. On recovery the patient complains of symptoms referable to the circulatory system—precordial pain, a sensation of tightness in the chest, dyspnoea, palpitations, or faintness. The precordial pain has no special characteristics and does not as a rule radiate down the arms. It is difficult to differentiate it from the pain caused by injury to the chest wall. It is important to remember that the initial shock may be followed by a symptom-free period during which the patient feels well and can take exercise normally. This latent period varies from a few days to a month, and in cases in which an aneurysm of the heart has developed the patient may remain apparently well for many years and then die as a direct but late result of the injury.

Physical Signs of Heart Injury

Acute traumatic dilatation of the heart occurs experimentally in the majority of cases but has not been definitely established in the human being. An increase in the area of cardiac dullness following injury may result from rupture of a valve or of the interventricular septum or from the development of a pericardial effusion.

The appearance of a thrill in a case in which it was known to be absent before the injury would point to rupture of a valve or septum. Similarly a fresh murmur would suggest one of the above injuries, a laceration of the endocardial lining of one of the chambers, or acute dilatation of the heart.

In cardiac contusion the heart sounds may be weak. Beck (1935) noted that in experimental animals the sounds had a characteristic "tick-tick" quality, and the recognition of this in a man who had received an injury from the steering-wheel of a car enabled him to make the diagnosis during life. With the development of a pericardial effusion the sounds become muffled. Pericardial friction is frequently observed, and such a finding gives definite proof of cardiac injury. Another suggestive finding after a chest injury is persistent tachycardia with a normal temperature. A few days after the injury the temperature may rise and there may be a slight leucocytosis. Abnormalities of rhythm commonly occur. The occurrence of extrasystoles cannot be used as evidence of cardiac injury since they may appear in many circumstances with a normal heart. Attacks of paroxysmal tachycardia are not in themselves of great diagnostic significance. Auricular flutter or fibrillation may be transient or permanent. They probably indicate some damage to the auricular wall or subendocardial haemorrhage in that situation. Partial or complete heart-block may result from damage to the bundle of His.

Contusion of the heart muscle may be followed by:

(*a*) *Complete Recovery.*—Recovery is probably more frequent than has been thought in the past, as the lesser degrees of contusion have not been diagnosed.

(*b*) *Reduced Cardiac Capacity.*—When shortness of breath on exertion first appears after a chest injury or becomes much more incapacitating after the injury than it was before, the possibility of cardiac contusion must be borne in mind.

(*c*) *Angina of Effort.*—Several cases have been recorded of typical angina of effort starting shortly after chest trauma in patients who were too young to be suffering from coronary artery disease. Where the coronary arteries are already narrowed trauma may precipitate the onset of symptoms.

(*d*) *Congestive Heart Failure.*—This follows soon after the injury when it is due directly to contusion of the heart muscle. When, however, the injury leads to prolonged paroxysmal tachycardia or auricular fibrillation or flutter there may be an interval of weeks or months before signs of failure make their appearance.

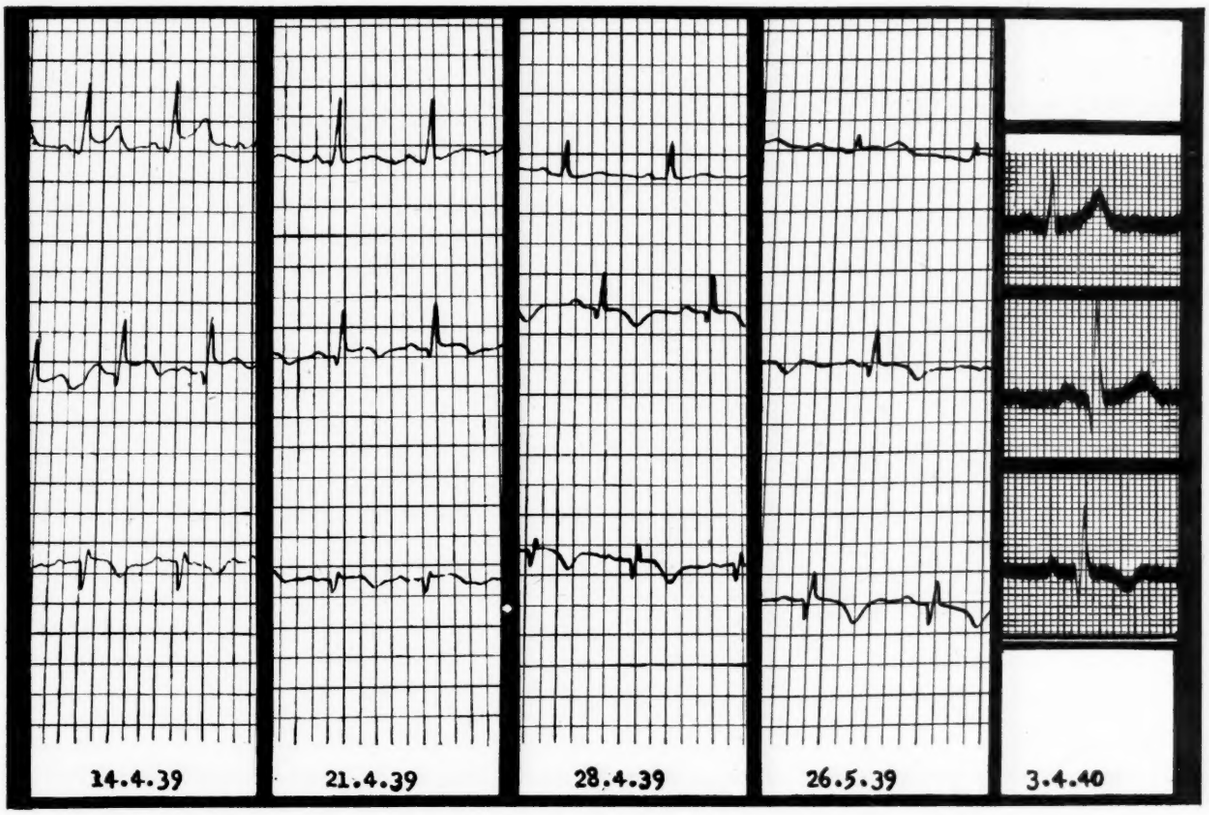
(*e*) *Rupture of the Heart.*—This complication may occur very rapidly after the injury, but if the tear has not penetrated the whole thickness of the heart wall blood may gradually force its way through the wall, tearing the muscle in front of it so that the final perforation may be delayed for some hours. On the other hand, perforation may not occur until a contused area of heart muscle has had time to soften. This softening is comparable to that which takes place in a cardiac infarct and, as in the case of a cardiac infarct, it is during the second week that perforation is most likely to occur. It is apparent from the clinical course that the leak is often a slow one. The pericardial sac fills with blood, and since the parietal pericardium is a tough and inelastic structure there soon comes a time when any further increase in the effusion compresses the heart and prevents diastolic filling, so that the circulation rapidly fails. The clinical manifestations of this condition are briefly as follows:

> There is sudden collapse and frequently complaint of precordial pain. The pulse may be slow at first, but as the compression of the heart increases it becomes more rapid and feeble. As the arterial pressure falls the venous pressure rises, so that the cervical veins become distended. There may or may not be a demonstrable increase in the area of cardiac dullness, but the heart sounds become gradually more distant and muffled. The patient may vomit. He becomes increasingly restless and distressed. As the circulation finally fails pallor ensues and consciousness is lost. In cases of doubt a definite diagnosis may be made by inserting a needle into the pericardial sac.

Electrocardiographic Evidence of Heart Injury

There have been some thirty cases of heart injury in which abnormalities of the electrocardiogram have been described. From these one can draw the following conclusions, which correspond closely with the findings in experimental animals.

The most frequent abnormalities affect the T waves, which may be unusually large or inverted. The RS-T complex may be elevated above the iso-electric line or depressed below it. Typical coronary T waves may occur. Such T waves are also found in myocardial infarction and in cases of pericarditis with or without effusion. They have been described, too, in cases of haemopericardium and of stab wounds of the heart



Electrocardiographic record of case. The first four tracings were taken with the Both portable electrocardiograph.

which have been surgically repaired. The Q waves may be abnormally deep, and various forms of arrhythmia and various grades of heart-block may be shown. The QRS complexes may be slurred or notched. In considering the diagnosis of cardiac trauma from evidence furnished by the electrocardiogram it is necessary that one should be reasonably certain that it was normal before the injury. The occurrence of transient changes in the electrocardiogram after an injury is therefore valuable evidence of cardiac involvement. The fact that the electrocardiogram may closely resemble that seen in cardiac infarction may be due simply to the presence of an area of contused muscle and haemorrhage in the wall of the heart. On the other hand, Schlomka (1934) has suggested that the functional derangements which follow an injury may be due to the fact that the trauma produces not only a muscle lesion directly but also, what is much more important, coronary artery spasm of a degree and duration sufficient to produce actual infarction of the myocardium.

Treatment

The early diagnosis of cardiac contusion is important because correct treatment may prevent the occurrence of perforation. The treatment of cardiac contusion is essentially similar to that of cardiac infarction—that is, absolute rest in bed for six weeks, morphine for the relief of pain, digitalis if signs of congestive heart failure should appear, and quinidine for certain cases of auricular flutter or fibrillation. A pericardial effusion large enough to embarrass the heart's action will require paracentesis.

No case has ever been recorded in which a perforation of the wall of the heart in a human being following a non-penetrating injury has been sutured. This does not, however, appear to be a surgical impossibility. Bright and Beck (1935) collected thirty such cases in which the patient survived the accident for more than an hour. In each case the opening into the cardiac chamber was small and there was little or no bruising of the myocardium. As death is by no means immediate even after rupture has occurred it appears that prompt surgical intervention might have saved the lives of some of these patients. It is therefore probably advisable, once the diagnosis of myocardial contusion has been made, to have a surgeon always close at hand. After perforation has occurred, and before the operation is begun, the patient might be kept alive by needling the pericardium and allowing blood to escape so as to prevent the development of cardiac tamponade.

Case Report

An amateur steeplechase rider aged 30 was first seen in consultation with Dr. D. P. Gray of Cirencester on April 14, 1939. Three days previously he had been thrown in a hurdle race and stepped on by a horse that was following. One hoof was said to have hit him over the heart and the other in the epigastric region. He was "winded" but did not lose consciousness. On recovering in a few minutes he felt pain all over his body, but was not particularly short of breath. He coughed up a little bright blood on two occasions. Since the accident he had been in bed, where his breathing was fairly comfortable, but he was dyspnoeic on getting out of bed and standing up. He complained of pain in the praecordium, the right scapular region, and the epigastrium, and of a sensation of tightness across the upper part of the sternum on taking a breath. He could feel his heart beating, and since the accident had been able to hear a noise synchronous with the heart-beat. He had had an evening temperature up to 100.4°.

Past History.—At the age of 9 he had had pneumonia and a left-sided empyema, for which rib resection was performed. Nine years before the accident he had been accepted for life assurance, and two years previously, when he had had slight jaundice, his heart had been examined and no comment made. Otherwise he had had no illnesses and was exceptionally fit, riding and playing strenuous games without difficulty. It

may therefore be assumed that his heart was normal before the accident.

Condition on Examination.—The patient was pale but not distressed. There were some abrasions and a slight swelling in the precordial region. The cardiac impulse was weak and there was a faint systolic thrill to be felt over the fourth intercostal space just to the left of the sternum. The apex beat was situated one-quarter of an inch internal to the nipple line in the fifth space. The area of cardiac dullness was not enlarged. There was a very loud blowing systolic murmur audible all over the praecordium and conducted round to the left base. It was maximum in the fourth space just to the left of the sternum. No second sound was audible except in the pulmonary area, where it could just be detected. The pulse was regular, 92 per minute, and of poor value, the blood pressure being 88/74. The lungs were clear. The electrocardiogram showed the RS-T complex elevated above the base line in all three leads—the elevation being maximum in Lead II—and a deep Q wave and inverted T wave in Lead III.

He was kept at complete rest in bed and was given tab. digitalis folia 1/2 grain t.d.s. During the following week he ran a slight irregular temperature and had some cough. On April 21 the signs in the heart were unchanged, but the blood pressure had risen to 114/76. There was an area of impaired percussion note and diminished air entry at the right base and rales were heard at both bases. The liver edge could be felt one inch below the right lower costal margin in the nipple line, but there was no oedema. The electrocardiogram now showed that T_1 was of low voltage and that T_2 was becoming inverted. The dose of digitalis was increased to 1 grain t.d.s. On April 24 radiographs (Dr. S. L. Mucklow) showed that the heart shadow was greatly enlarged in all diameters, the shape of the shadow suggesting enlargement of the heart rather than pericardial effusion. On April 26 the patient had two syncopal attacks. The blood pressure had fallen to 100/64 and pericardial friction was heard over the apex of the heart. On April 28 T_2 was definitely of coronary type. On May 5 pericardial friction could be heard over the whole of the lower half of the praecordium. Although his blood pressure was only 96/64 his general condition had improved, and from that time he continued to make steady progress, although he still had occasional syncopal attacks after meals. On May 12 the pericardial friction was no longer audible. After eight weeks in bed he was allowed up. His blood pressure was still low—97/70—but he was able gradually to increase his exercise. On October 31 radiographs showed that there was only slight enlargement of the left ventricle. On April 3, 1940 (a year after the accident), it was reported that he was taking all ordinary exercise without shortness of breath or discomfort. The heart signs were unchanged, except that no systolic thrill could now be detected. The blood pressure had risen to 115/85 and exercise tolerance was good. The electrocardiogram was approaching normal, although the RS-T complex in Lead II was still slightly elevated, T_1 was large and peaked, and T_3 was still inverted.

Discussion of Case

There seems little doubt that this accident resulted in more than one lesion of the heart. The appearance of a systolic thrill and a loud systolic murmur after the accident might be accounted for by a rupture of the mitral valve or a perforation of the interventricular septum. It is impossible to say with certainty which of these two lesions was actually present. The marked dilatation of the heart which occurred might have resulted from one of these lesions or might correspond to the acute dilatation which has been observed in animals after trauma to the heart. It is interesting that the clinical findings did not lead one to expect the great dilatation which the radiographs revealed.

The finding of electrocardiographic changes resembling those of coronary thrombosis suggested that there was contusion of the myocardium in addition. It is true that coronary changes of T_2 type (in which the elevation of the RS-T segment and later the inversion of T are maximum in Lead II) are found in association with pericarditis; but pericarditis was probably not the cause of the changes in this case, as they were found as early as the third day after the accident, whereas pericardial friction was not heard until twelve days later.

Summary

Injury to the heart due to non-penetrating blows is commoner than has been supposed and is not necessarily fatal. From a consideration of the cases already published and of animal experiments a brief description of the morbid anatomy, symptoms, signs, and treatment of the condition is given. A new case is recorded.

I wish to thank Dr. G. A. Allan of Glasgow for kindly supplying the final report and electrocardiogram.

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INSULIN TREATMENT OF SCHIZOPHRENIA IN WARTIME

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Recent correspondence in the columns of the *British Medical Journal* has raised two questions in connexion with the continuation of the insulin treatment of schizophrenia in wartime. The first of these throws some doubt on the value of the method as a cure, and the second points out that it requires the use of large amounts of both sugar and insulin. This, it has been said, is not justified in view of the shortage of sugar and the difficulties that may be encountered in importing the raw materials required for the manufacture of insulin.

It is not our intention to discuss the former question in this paper. The last word has yet to be said on this subject, but we do not doubt its value in certain cases of this disease, for we have seen patients respond to insulin treatment who had previously failed to respond either to cardiazol or to electrical convulsion therapy. Furthermore, we have seen cases in which combined insulin and convulsion therapy met with complete success after failure of either alone to influence the course of the psychosis. With the latter question we concerned ourselves at an early date after the introduction of sugar rationing, for it was obvious to us that the allowance of half a pound of sugar a week would in no manner meet the requirements of patients undergoing this form of therapy. With the problem of economy in the amounts of insulin used we did not concern ourselves until a later date.

The technique of insulin treatment adopted at most hospitals is somewhat as follows. The patient is given intramuscular injections of insulin. Starting at 15 to 20 units, the dose is increased daily until it induces hypoglycaemic coma. If there are no contraindications the patient is allowed to remain in coma for one and a half to two hours, after which time the coma is terminated by feeding seven ounces of sucrose in solution into the stomach through a nasal tube. Recovery usually takes

place within half an hour, and the patient is then given a sweetened drink of tea or other beverage. To prevent the occurrence of a late coma or shock during the night a sweetened drink is given before retiring. By this method each patient requires about one pound of sugar a day. This amount is greatly in excess of that allowed by the Government's sugar-rationing scheme, and although provision has now been made for this we determined to find a more economical method.

Economy in Sugar Consumption

First of all the quantity of sugar given by nasal tube to terminate the coma was reduced, but it was found that any amount less than seven ounces was uncertain in its action, recovery being delayed in some cases for an hour or more, and in those patients who did regain consciousness there was a tendency to lapse into coma again very soon after recovery. When the amount of nasal sucrose was reduced to four ounces, only one of our ten patients undergoing treatment recovered without an intravenous injection of 33% glucose. Our next experiments were with sugar substitute. For this purpose we chose potatoes. These were mashed and mixed into a "soup" of the consistency of a thin gruel with milk and water. The potatoes, however, tended to block the nasal tube or even a size 20 stomach tube by precipitation, and had to be forced into the stomach by means of a glass syringe. Here the same difficulties of delayed recovery and a tendency to lapse into coma again were encountered, and the method was abandoned. It was now decided to administer 20 c.cm. of 33% glucose intravenously to terminate the coma, and to follow this, on recovery, with a pint of the potato soup. This has been invariably successful. After the injection of glucose recovery is rapid, and within one to three minutes the patients are able to respond to questions and to drink the soup. This is much liked by them; they prefer it to the sucrose drinks previously administered. We have not had one instance of the vomiting that was quite common after the sugar solution had been drunk. The potato soup is prepared as follows. Twelve ounces of potatoes are boiled and mashed for each patient on treatment. This is beaten to a consistency thin enough to be readily drunk by mixing it with milk, with the addition of the water in which the potatoes were boiled. More water may be added if required. Each patient gets one pint. Three hundred and one comas have been terminated in this way. No late shocks have occurred, and in only four instances has it been necessary to give an additional injection of glucose. One of these was after the patient had had an epileptiform fit. In two the patient was excited and would not drink. In the fourth no cause was ascertained; the patient was drowsy, and was given another 20 c.cm. of glucose. The veins are still patent and show no sign of thrombosis or occlusion from repeated venepuncture. The patient is allowed a sweetened drink from his own sugar ration after the soup. In the evening potatoes are again substituted for the sweetened drink, half a pint being allowed. In this way the carbohydrate intake is adequate; late comas are avoided, and the patients keep to their allowance of eight ounces of sugar weekly. Since tea rationing cocoa has been substituted for the morning drink of tea. The amount of sugar contained in the 20 c.cm. of intravenous glucose is approximately 7 grammes.

Economy of Insulin

Having effected considerable economy in the amounts of sugar used we next turned our attention to the possibility of effecting some economy in the amounts of insulin.

By the ordinary intramuscular method of administering insulin for shock therapy doses varying within very wide limits for different patients are required. In our experience 18 units successfully induced a deep coma in one patient, while 384 units failed to affect another patient. At the extreme end of this scale large amounts of insulin are therefore being used daily. We decided accordingly to administer the insulin intravenously and to determine whether or not any saving could be effected in this way. In our first experiment a female schizophrenic patient aged 36 was given 6 units of ordinary insulin intravenously, and blood-sugar estimations were carried out to determine the effect on the blood sugar. The blood sugar reached a hypoglycaemic level of 14.5 mg. per 100 c.cm. within half an hour, and gradually increased from that time, until one and a quarter hours after the injection it was nearly as high as the fasting level. There was, however, no sign of the patient's becoming comatose. On the following day 12 units were given, and lumbar puncture was performed to determine what change, if any, in the C.S.F. sugar level had taken place. This is illustrated in Chart I.

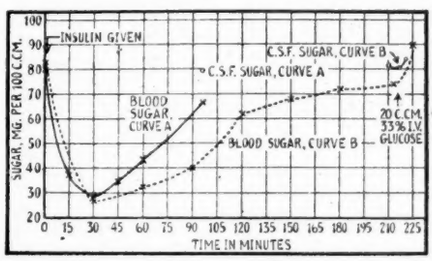

CHART I.—Curves showing the effect on the blood and C.S.F. sugar of ordinary insulin and protamine-zinc-insulin given intravenously. Curve A = C.S.F. and blood sugar after 12 units ordinary insulin intravenously. Curve B = C.S.F. and blood sugar after 10 units protamine-zinc-insulin intravenously. There were no comas.

The behaviour of the blood sugar was similar to that when 6 units were given. It is clear, therefore, that although 6 units of insulin were sufficient to reduce the blood sugar to a hypoglycaemic level, this amount was not sufficient to keep it at that level long enough for the sugar present in the cerebrospinal fluid, and therefore in the nervous system, to be oxidized. It has been shown by Day and Niver (1937) that coma does not supervene until the C.S.F. sugar has reached a low level, and that this does not occur for an hour after the blood sugar has come down and has been kept down. We therefore increased the dose of insulin given intravenously until an amount was reached that induced coma. This is approximately 25 to 70% of the dose required by intramuscular injection. It was confirmed that there was a marked decrease in the C.S.F. sugar when the patient was in coma. The accompanying table gives the doses of insulin required by intravenous injection and by intramuscular injection to produce coma.

Case No.	Coma Dose of Intramuscular Insulin	Coma Dose of Intravenous Insulin	Net Saving
1	28 units	16 units	43%
2	122 "	70 "	43%
3	120 "	90 "	25%
4	80 "	40 "	50%
5	48 "	28 "	42%
6	124 "	76 "	39%
7	116 "	36 "	69%
8	116 "	44 "	62%
			Av. 46.6%

In another attempt to reduce further the amount of insulin required we decided to use protamine-zinc-insulin intravenously because of its reputed prolonged action in depressing the blood sugar. We thought that it might bring this down to hypoglycaemic level and

maintain it there until the C.N.S. sugar was oxidized. Chart I also shows the effect of 10 units of protamine-zinc-insulin on the blood sugar and the C.S.F. sugar of another schizophrenic patient. We found the fall in blood sugar after the injection to be as rapid and profound as with ordinary insulin, but the remainder of the curve is flatter and the blood sugar remains depressed for a longer period. This suggests that when given intravenously this substance is less stable than when given subcutaneously. The blood sugar eventually rose to its original level although no sugar had been given, indicating that when exogenous insulin has been administered the forces concerned in keeping the blood sugar at a constant level are called into play to overcome the action of the insulin. The C.S.F. sugar is also unaffected until a dose large enough to induce coma has been given. The other points already noted about the C.S.F. sugar are also illustrated. In actual practice we found that the coma dose of intravenous protamine-zinc-insulin was about the same as that of ordinary insulin given intravenously, and that nothing was gained by its use.

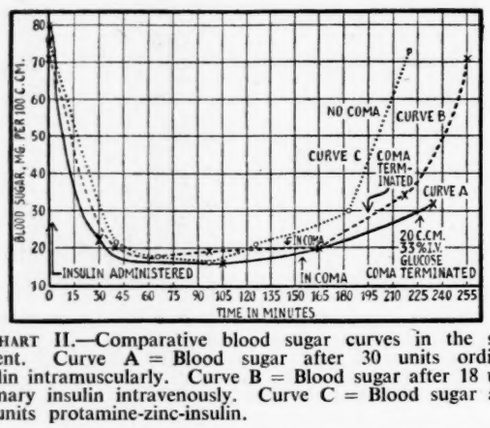

CHART II.—Comparative blood sugar curves in the same patient. Curve A = Blood sugar after 30 units ordinary insulin intramuscularly. Curve B = Blood sugar after 18 units ordinary insulin intravenously. Curve C = Blood sugar after 18 units protamine-zinc-insulin.

Chart II is a composite graph showing the effect on the blood sugar of ordinary insulin given intramuscularly and intravenously and of protamine-zinc-insulin given intravenously in the same patient. In Curve A 30 units of ordinary insulin were given by intramuscular injection. The blood sugar did not reach its lowest level until one and three-quarter hours after injection, and coma intervened about three hours after injection. Note the slow rise in the blood sugar in this case. The C.S.F. sugar before coma was terminated was 28 mg. per 100 c.cm., and rose to 30 mg. five minutes after 33% intravenous glucose was given. Coma therefore does not intervene until the sugar in the brain cells has been metabolized under the influence of insulin—a condition reflected in the C.S.F. sugar. The C.S.F. sugar in coma is about 30 mg. below the fasting blood-sugar level, and is little changed, showing either a slight rise or a fall, as noted above, by the intravenous injection of glucose, even though the patient is out of coma. It is to be presumed that the C.S.F. sugar does not rise for some time, although the brain cells are being adequately supplied from the blood stream.

In connexion with lumbar puncture we invariably found that the cerebrospinal fluid was under increased pressure while the patient was in coma, being 350 mm. in one patient. Within a minute of giving 20 c.cm. of 33% intravenous glucose to terminate the coma the pressure had fallen to 180 mm. After five minutes the pressure was 75 mm., which is within normal limits. Chart I also shows the effect on the C.S.F. sugar when 20 c.cm. of 33% glucose was given intravenously. The lumbar puncture needle was left *in situ* and the 20 c.cm. of intravenous glucose was administered. At the end of this injection cerebrospinal fluid was collected for two minutes, and this specimen showed a fall in the C.S.F. sugar. A third specimen was taken five minutes later; this showed in some cases a slight rise in the C.S.F. sugar and in others a fall. The behaviour of the C.S.F. sugar following intravenous glucose is therefore not constant.

Methods of Administration Compared

Some questions may be raised as to the comparative safety of giving insulin, both ordinary and protamine-zinc, intravenously, as against giving it intramuscularly. The ordinary insulin used by us has an acid *p*H of 3.7. No ill effects have been observed from its use intravenously, as such a small quantity is rapidly buffered by the blood withdrawn into the syringe and in the veins after the injection. The *p*H of protamine-zinc-insulin is 7.1, and therefore about the same as the body fluids. The question of anaphylactic shock after the intravenous injection of protamine-zinc-insulin must be considered. We may say that we have not encountered any sign of it, and in spite of the manufacturer's advice against its use intravenously it appears perfectly safe to administer by this route. The Folin-Wu method of estimation of the blood sugar was used, in which there is a basal level of about 9 mg. per 100 c.cm., due to other reducing substances in the blood. We have often had blood sugars of 9 and 10 mg. half an hour after the injection of the intravenous insulin while the patient was well and talkative, only later relapsing into coma. This means that the sugar can be totally removed from the blood without the patient showing any ill effects, and until the C.S.F. sugar falls coma does not occur. Only one epileptiform fit has occurred in the course of this work. This was in a patient who was given 20 units more than her coma dose of intravenous protamine-zinc-insulin. She readily recovered after the injection of 20 c.cm. of intravenous glucose.

In general, we found that the coma produced by intravenous insulin is much quieter than that induced by intramuscular insulin. The general appearance of the insulin room during intravenous treatment is extremely quiet. It appears to us that there is less likelihood of the patients relapsing again into coma after their glucose injections on intravenous insulin, as there is no continued absorption of insulin which takes place for many hours after an intramuscular injection. We had no cases of relapse into coma after the intravenous glucose injection on this treatment.

Summary

A method of carrying out the insulin treatment of schizophrenia has been described which does not necessitate the use of large quantities of sugar. The substitution of intravenous for the ordinary intramuscular method in general use has been shown to effect an average saving of 46.6% of insulin.

We are indebted to Dr. T. P. Rees, medical superintendent at Warlingham Park Hospital, for his active interest and practical advice in this work and for his permission to publish this report. Our thanks are also due to Mr. E. J. Bishop, laboratory technician at the hospital, who carried out the numerous blood-sugar estimations for us, and to Messrs. Allen and Hanburys for a generous supply of protamine-zinc-insulin.

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G. L. Hallez (*Nourrisson*, 1940, **28**, 22) records a case of paratyphoid A in a male infant aged 1 year, which is remarkable owing to the rarity of the disease at that age. The fever continued until the ninth day, when some rose spots appeared. There were no other signs of the disease and the spleen remained normal. Recovery took place. The father, who was a nurse in a fever ward, may have acted as a carrier.

SPONTANEOUS PNEUMOTHORAX SIMULATING CORONARY DISEASE

BY

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Artificial pneumothorax is one of the conditions which clinically may simulate coronary disease. The two cases of spontaneous pneumothorax here described were regarded as being cardiac when first seen. One gave a clinical picture practically indistinguishable from that of coronary infarction, and the other a picture very much like that of angina of effort.

In the absence of electrocardiographic and radiographic assistance the diagnosis in such cases may be extremely difficult, for a small partial pneumothorax often gives rise to very slight signs, or to none at all. If the electrocardiograph is the only special means of investigation available certain other facts tend to complicate the problem; for some cases of coronary disease show no abnormality in Leads I, II, and III, and this is revealed only if a Lead IV tracing is taken. Again, it is possible for slight coronary infarction to occur even with a normal Lead IV tracing, either because the lesion is in a "silent" area or because it is of small size. Moreover, in some patients with angina of effort the tracing in all leads is at first normal, although later changes may appear (Bourne and Evans, 1938). An additional difficulty is the fact that pneumothorax, probably by rotating the cardiac axis, may produce electrocardiographic abnormalities suggesting coronary disease. These are most commonly T wave abnormalities, S–T deviation from the iso-electric level, and absent or greatly reduced positive initial deflection in the standard Lead IV electrocardiogram (Master, 1928; Master and others, 1937; Perrin and Drouet, 1930).

Case I. Pneumothorax simulating Coronary Infarction

The patient, a man aged 37, had been perfectly well until seven days before examination, when he complained of a pain across the lower chest. This was partly a feeling of compression, and it was increased by exercise. He had no pain while resting. The pain was not increased by food or by muscular movement and did not radiate to the arms, but was increased by a deep breath. The following day the pain became worse, and on the third day was still so bad as to require an injection of morphine. His pulse rate was noticed to be increased and the blood pressure low. The pulse rate had remained higher than 100 up to the time of examination. Movement in bed, even sitting upright, produced shortness of breath subsequent to the attack. No exertion could be undertaken because of this shortness of breath. There was no palpitation and no giddiness. On examination the pulse rate was 100, the rhythm regular. The area of cardiac dullness was moved slightly to the right, and over the left lower chest the vocal vibrations, percussion note, and respiratory murmur were all diminished in the standing position. When the patient lay down this area of dullness disappeared and was replaced by a hyperresonant note. On screening the chest the presence of a hydropneumothorax on the left side of the chest was confirmed. Fluid which was withdrawn was deeply blood-stained.

Remarks.—There was no previous history of any attack of pain in the chest, of pulmonary tuberculosis, or of any inflammatory lesion of the lungs or pleura. He had, however, suffered severe injuries fracturing ribs in two aeroplane accidents. It is possible that these injuries had produced adhesions between the lung and the thoracic wall, which had somehow become torn, causing the haemopneumothorax. The type of pain as described in the history was exceedingly like that of a coronary infarction, and the tachycardia, low blood pressure, and shortness of breath which accompanied and followed the pain were also very suggestive of an infarction. It is quite clear that if fluid had not been present the diagnosis clinically might have been impossible without an electrocardiogram. Even this might have shown changes suggestive of coronary infarction.

Case II. Pneumothorax simulating Angina of Effort

A man aged 38 who had previously had rheumatic fever, scarlet fever, and tonsillitis began to suffer from pain in the left side of the chest three weeks previous to examination. This pain was accentuated on exertion and relieved by resting. It was quantitative, being absent if he walked slowly, and increasing if the pace was quickened. Simultaneously there was also a dull ache on the left side of the chest. The pain was most severe during the first two or three days and slowly subsided until the day previous to examination, when it returned. This second time it was again quantitative, increasing during exertion and disappearing with rest. There was no shortness of breath and no orthopnoea. A slight sense of constriction accompanied the pain. Palpitation was noticed on the left side of the chest, especially at night. The patient was more easily tired than normally.

On examination no abnormality was discovered in the chest; the apex beat was in the mid-clavicular line and the heart sounds were clear. No abnormality was found in the lungs on the first examination, but subsequently, after the diagnosis had been determined by the screen examination, very slight differences in the physical signs were observed, the changes being against the left side. The blood pressure was normal—140/94—and no abnormality was found in the abdomen. On screening the chest a left-sided pneumothorax was discovered, with only a moderate amount of pulmonary collapse. The electrocardiogram showed no abnormality in the first three leads, but in Lead IV the 'R wave was very small and the S–T deviation suggested the possibility of coronary disease.

Remarks.—The age of the patient is somewhat below that at which angina of effort is common, but the history was very suggestive. The facts that the pain was chiefly on the left side of the chest and that it did not radiate into the arms were also important. There was nothing in the patient's history proving a definite severe blow on the chest, but he had been a cricketer until three weeks previously.

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The Social Service Department of St. Thomas's Hospital, which includes the Samaritan Fund and the work carried out under the direction of the lady almoner, has had during the year covered by its latest report to face the problems created by evacuation. In the case of patients or recent patients who at the beginning of the war sought safety by moving to the country it became necessary for the almoner to assure herself that any requisite treatment could be continued at a local hospital or under a private practitioner; also that those who remained in their own homes while the hospital was largely emptied had the services of a district nurse and any other help that might be needed. "Perhaps more important than anything else to the people of Lambeth, who all their lives in times of stress have looked to the hospital for guidance and help, was the knowledge that St. Thomas's, working indeed under unusual conditions and with many restrictions, sandbagged and short-staffed, preserved its identity and was still a haven of refuge to the afflicted."

GOLD THERAPY IN RHEUMATOID ARTHRITIS

BY

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Although much has been written on the treatment of chronic arthritis of the rheumatoid type by injections of gold compounds no statistical study that shows the difference between the results in treated and untreated cases seems to have been published as yet.

History

Hartfall, Garland, and Goldie (1937) found a statistically significant difference in the recovery rate of cases of rheumatoid arthritis treated with different gold compounds. The nearest approaches to our present study, however, are the animal experiments carried out on the "infectious arthritis of mice and rats." This is a naturally occurring epidemic disease of rodents, and sometimes arises spontaneously in laboratory animals. It can be transmitted from one animal to another artificially by injecting fluid from the joints or internal organs of infected animals into the joints of the healthy animals. Collier (1939) found that injection of such gold compounds as aurodetoxin and solganal B into rats protects them against experimental infection. Findlay, Mackenzie, and MacCallum (1940) have shown that infectious arthritis of rodents is due to a pleuropneumonia type of organism. Like Collier, they were able to show that gold compounds would protect against the inoculated disease, solganal B being the most efficacious. Arsenical compounds also had a prophylactic action, but not so great as that of gold. No effect was produced by any of the sulphonamide derivatives. These results are the most suggestive, as Swift and Brown (1939) claim to have isolated a pleuropneumonia-like organism from human cases of acute rheumatism.

Mode of Investigation

Solganal B was the gold compound used for this particular investigation. From the cases of rheumatoid arthritis coming under our care only typical cases were chosen. These were divided into three groups of thirty cases. One group was injected with solganal B in doses of 0.2 gramme weekly, having first been tested for sensitivity by means of three initial weekly injections of 0.01, 0.05, and 0.1 gramme respectively. Doses of 0.3 gramme were sometimes used in resistant cases in this group, which will subsequently be referred to as Group I or "the large-dose group." Group II, or the "small-dose group," was treated by means of weekly doses of 0.1 gramme of solganal B, this dose never being exceeded. These patients were tested initially for sensitivity by two injections of 0.01 and 0.05 gramme respectively. Group III, or the "control group," was given weekly injections of sterile almond oil. (This is an innocuous oil often used for suspending gold compounds.) All injections were made into the gluteal muscles. Treatment was continued for periods of nine months in each case. It was divided into two courses by an interval of six weeks. Progress was assessed by monthly recordings of the blood sedimentation rate (Westergren) and of the circumference of any swollen joints. Radiography and clinical examination of affected joints were carried out before and after treatment. The urine was tested for albumin weekly. All results are those found at the end of nine months' treatment.

In an attempt to ascertain that the three groups were similar the ages at the onset of the disease were averaged for each group, also the duration of the disease and the initial blood sedimentation rate. They are shown in Table I.

TABLE I.—*Age at Onset of the Disease, Duration of the Disease, and Initial Sedimentation Rate in Each Group of Patients*

	Group I Gold (Large Doses)	Group II Gold (Small Doses)	Group III Controls
Age at onset in years :			
Minimum	18	17	15
Maximum	56	68	70
Average	40	39	39
Duration in years :			
Minimum	0.2	0.2	0.2
Maximum	37	26	25
Average	7	8	7
Initial sedimentation rate in mm. :			
Minimum	8	7	2
Maximum	60	69	55
Average	25	33	24

The average age of the patients and the duration of the disease in the three groups, as can be seen, are almost identical. The average initial sedimentation rate in Group II is slightly higher (8 to 9 mm.) than in the other two groups, but the difference is not considered sufficient to be of prognostic significance.

Results

In assessing the results it was decided to take count not of the cures but of the cases in which the disease has been rendered inactive. A patient who has had the complaint for several years can never be cured, as destruction of cartilage and bone causes permanent impairment of the function of the joint. What chemotherapy can hope to do is to render the disease inactive so that no further damage will be done, and it is usually found that when this happens the patient is able to return to a full, useful, and above all comfortable existence despite extensive damage to joint structures. We have used the following criteria of inactivity of the disease: (*a*) the patient must be completely free of subjective joint pain; (*b*) if there is limitation of movement in any joints this must be painless; (*c*) the sedimentation rate must be normal. Though many of the patients were able to get about and carry on their normal duties, their cases have not been classed as inactive on account of some degree of pain on prolonged use of the joints or on attempting movement of the joints through their maximum possible range. Owing to the difficulty of finding accurate standards for grades of improvement we have not attempted to split up the group of patients improved by the treatment but not rendered inactive. Table II shows these results in tabular form.

TABLE II.—*Results at the End of Nine Months' Treatment or Observation*

	Rendered Inactive	Improved	Unaltered	Worse	Totals
Gold (large doses)	14	14	2	0	30
Gold (small doses)	8	20	1	1	30
Controls	1	22	6	1	30

From this it will be seen that of those treated with large doses of gold 14 (47 per cent.) became inactive within nine months of starting treatment. Of those treated with small doses of gold 8 (27 per cent.) and of the controls 1 (3 per cent.) have become inactive. Reference to a statistical table (Loewenthal and Wilson, 1939) shows that the probability of these results not being due to chance would be expressed as within the limit of $P = 0.005$ in the large-dose group and $P = 0.05$ in the small-dose group. The former, which means that it is 199 to 1 against the results being due to chance, is considered very convincing evidence by statisticians; and the latter, which indicates 19 chances to 1, is thought to be satisfactory evidence of the value of a method of treatment.

TABLE III.—*Alteration in Sedimentation Rate at the End of Nine Months' Treatment*

	Sedimentation Rate Raised	Sedimentation Rate Lowered	Sedimentation Rate Reduced to less than 10 mm.
Gold, large doses ..	2	28	23
Gold, small doses ..	1	29	11
Controls	17	13	4

In Table III the final changes in the blood sedimentation rate are summarized. From this it can be seen that in the control cases there is, on the average, no marked change in the sedimentation rate at the end of nine months. The rate has been increased in 17 (57 per cent.) and reduced in 13 (43 per cent.). In cases treated with small doses of gold, on the other hand, the sedimentation rate has become lowered in 29 (97 per cent.), and in cases treated with large doses of gold it has become lowered in 28 (93 per cent.). On examining the results in the last column of Table III—that is, the number of cases in which the sedimentation rate is normal at the completion of nine months' treatment—one finds that in the large-dose group 23 (77 per cent.) have become normal, whereas in the small-dose group 11 (37 per cent.) and in the control group only 4 (13 per cent.) have become so. These results are of statistical significance both as regards the comparison between gold and control cases and between cases receiving large and small doses of gold.

TABLE IV.—*Effect of Gold Treatment on Swelling of Joints in Rheumatoid Arthritis*

	Increased	Unaltered	Diminished	Total
Gold, large doses ..	3 (8%)	10 (26%)	26 (66%)	39
Gold, small doses ..	10 (14%)	19 (27%)	42 (59%)	71
Controls	8 (18%)	22 (50%)	14 (32%)	44

Table IV shows the effect of the treatment on joint swelling. The swelling is diminished in 66 per cent. of swollen joints when the larger doses of gold are used, in 59 per cent. of joints treated with the smaller doses, and in 32 per cent. of the control cases.

Table V shows the alterations in the radiographic appearances during treatment. Unfortunately radiographs before and after treatment are not available in a number of the cases. The following points have been studied: destruction of cartilage, decalcification of bone, and swelling of soft tissues.

TABLE V.—*Effect of Gold Therapy on the Radiographic Appearances of Joints in Rheumatoid Arthritis*

	Number of Cases			
	Improved	Unaltered	Aggravated	Totals
Decalcification of bone :				
Gold (large doses) ..	2 (29%)	3	2	7
Gold (small doses) ..	2 (22%)	7	0	9
Controls	0 (0%)	8	4	12
Erosion of cartilage :				
Gold (large doses) ..	1 (14%)	4	2	7
Gold (small doses) ..	0 (0%)	8	1	9
Controls	1 (8%)	9	2	12
Periarticular swelling :				
Gold (large doses) ..	6 (86%)	1	0	7
Gold (small doses) ..	7 (78%)	2	0	9
Controls	0 (0%)	9	3	12

As can be seen from the table there is a tendency towards improvement in bone decalcification, no definite change in the amount of cartilage destruction, and a marked improvement in the periarticular swelling in treated cases. It seems probable that the amount of bone decalcification denotes the extent to which a joint, or possibly the limb as a whole, is used, so that its improvement may simply be a measure of greater mobility of the joint following freedom from pain. As is well known, repair of cartilage, if it takes place at all, is a very slow process, so that probably a nine-months period of observation would be inadequate to show marked changes. Nevertheless in two cases there did appear to be a definite increase in joint space not attributable to altered position at the time of the radiograph. As one of these was a control case the result cannot be attributed to treatment.

Table VI gives a rough indication of the alterations in physical signs during treatment. Unfortunately a detailed study has not been carried out on the small-dose cases.

TABLE VI.—*Effect of Gold Therapy on the Physical Signs in Rheumatoid Arthritis*

	Number of Joints			
	Improved	Unaltered	Increased	Totals
Gold (large doses) ..	49 (54%)	39 (43%)	2 (2%)	90
Controls	39 (35%)	59 (55%)	10 (10%)	108

These results only take into consideration gross changes in physical signs such as the return to full movement in a joint which was previously limited or the disappearance of periarticular swelling in a joint in which this was previously marked. As can be seen the physical signs show improvement in a higher proportion of the treated cases and aggravation in a higher proportion of the controls. Our clinical impression was that the difference between the two groups of cases was greater than is indicated in the table. Possibly this was due to changes of amelioration being greater in degree than in number in the treated group.

While these results provide evidence that aurothioglucose (solganal B) does have an antagonistic effect on the disease process in rheumatoid arthritis and that this effect is more marked when 0.2 gramme is the weekly dose than when it is only 0.1 gramme, they do not take into consideration the toxic effects of gold on the patient.

Toxic Effects

Ever since gold therapy was introduced the toxic effects occurring in this form of treatment have figured prominently. Some workers have limited their use of gold compounds considerably on this account, and it is agreed that these effects are a deterrent to the more general use of the method. In recent papers (Ellman, 1938; Ellman and Lawrence, 1938) it was suggested that the more serious toxic effects occurred only after the sedimentation rate of the blood had become normal, and this was actually found to be the case in all such instances up to that time. Since then we have noted one exception to this rule. Out of a total of twenty-five cases of gold intoxication which we have encountered 96 per cent. have occurred in the presence of a normal sedimentation rate. It is remarkable how often dermatitis and stomatitis appear if the injections are continued after the sedimentation rate has become normal. This is particularly the case when the larger doses are used. We therefore stop the course of gold injections if the sedimentation rate falls below 12 mm. After three to four weeks' rest the injections are resumed, but a smaller dose—about 0.02 gramme weekly—is given.

The most important of the toxic effects are stomatitis, exfoliative dermatitis, toxic jaundice, and the blood dyscrasias (purpura, agranulocytosis, and aplastic anaemia). Table VII shows the incidence of these in the two groups of cases treated with gold. Cases of small ulcers on the gum due to artificial dentures are not included in this table as they are common to gold and control groups alike. The term "dermatitis" has been applied only to the itchy scaly eruption typical of gold intoxication. Urticaria and mild erythemata are often met with in rheumatoid arthritics even when not treated with gold, and have therefore been omitted from this table.

TABLE VII.—*Incidence of Toxic Effects in Cases treated with Large and Small Doses of Gold*

	Gold (Large Doses)	Gold (Small Doses)
Stomatitis	8	1
Dermatitis	8	5
Agranulocytosis	1	0
Jaundice	1	0

As can be seen from the table stomatitis and dermatitis are common complications and are more frequent when large doses of gold are used. The case of jaundice was mild and evanescent. We have not met with the severe fatal form

recorded by Hartfall, Garland, and Goldie (1937). Our case of agranulocytosis (Ellman and Lawrence, 1935) was unfortunately fatal: purpura haemorrhagica was also present. We have not had any further case of this type since adopting the above-mentioned principle of using great caution when the blood sedimentation rate has become normal. Albuminuria was often met with when the larger doses were employed. It proved transient, and was not associated with other evidence of kidney damage. It was not considered an indication for stopping the treatment.

Discussion

The results provide definite evidence of the ability of aurothioglucose to alter favourably the course of the disease in cases of rheumatoid arthritis. Our observations of course refer to results at the end of nine months' observation. We have so far no evidence as to the relapse rate, as cases have not been followed up for more than a year or two after completion of treatment. Recurrence has, however, not been encountered among patients in whom the disease has been rendered completely inactive. We have had several relapses in patients who abandoned treatment while the disease still showed signs of activity.

In the absence of similar proof for other methods we therefore recommend the adoption of this treatment as a routine for all cases in which the disease shows evidence of a progressive course. Prolonged observation of these cases before instituting gold therapy, in the hope that spontaneous remission may occur, is not considered advisable, as permanent destruction of cartilage may result and complete restoration to normal will then be impossible. General constitutional, physical, and orthopaedic treatment, together with specific occupational therapy where possible, should of course be combined with the gold treatment in order to restore the maximal functional efficiency to the joints.

With regard to dosage, this is a difficult point to decide. The weekly dose of 0.1 gramme used by most workers nowadays has the advantage of causing fewer toxic effects. On the other hand, a dose of 0.2 gramme weekly will cure a larger proportion of cases, but produces toxic effects more readily. We consider that the most suitable dosage is still undecided.

Summary

A series of ninety typical cases of rheumatoid arthritis were divided into three equal groups. One group was used as a control, while the other two were treated with large and small doses of gold respectively.

Pain, limitation of movement, periarticular swelling, blood sedimentation rate, and radiographic signs have been studied in each group.

From the data obtained from these three groups at the end of nine months' treatment statistical evidence of the value of aurothioglucose (solganal B) in the treatment of rheumatoid arthritis is produced.

Suggestions are brought forward as to a method of reducing the frequency of toxic effects resulting from the gold compound.

We wish to express our thanks to Dr. Allen Daley, Chief Medical Officer of the London County Council, and Dr. Sandiland, Medical Superintendent of St. Stephen's Hospital, for giving us facilities to enable this work to be carried out; also to Sir Leonard Hill and Professor R. Fraser for their kind help and criticism.

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WARTIME PRECAUTIONS FOR DIABETICS

BY

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In a country where air raids are daily events and invasion a possibility diabetics are liable to special dangers, against which they should be warned and forearmed. Mild cases not on insulin are in no real danger, as neither starvation nor departure from proper diet for a day or two is of grave consequence. But it must be clearly understood that most insulin cases owe their health entirely to regular daily injections and that it is not safe to stop them. True, some diabetics who need only small doses (under 20 units a day) can miss insulin for a few days without danger, although of course sugar would almost certainly recur. But more severe cases depending on larger doses—30 to 60 or more units a day—may get into serious trouble from missing even one dose, and to miss two or three doses would certainly be dangerous. Sugar returns as soon as the insulin action is exhausted, even if no food is eaten; *acetone* bodies rapidly follow, and coma from ketosis may result within *a day or two*. A second danger is that hypoglycaemia may occur if adequate carbohydrate is not available or is not eaten to balance the insulin, and it might come on with protamine-insulin the following night if supper was omitted. The following advice and precautions on various difficulties are therefore given.

Routine Precautions

Diabetics can rest assured about the stocks of insulin in this country; these are enough for two years, and fresh supplies are being made, as before the war, by British manufacturers. But circumstances might arise in which its local distribution would be temporarily upset, and I should advise insulin patients to have a month's supply in hand. Most diabetics who buy their own insulin have already seen to this, and I hope doctors will arrange that insured cases have a reserve. Many doctors have been in the habit of prescribing a month's supply for their panel patients, and the prescription of a small reserve is quite in order and should be done.

It is wise for all diabetics to carry insulin and a syringe with them whenever there is the slightest possibility that they may not get back home at the time planned for the next injection. Every diabetic who travels or works away from home should certainly do this. Diabetics should also carry a small supply of *carbohydrate*, such as sugar, chocolate, biscuits, in their pockets, so that if the regular timing of meals is upset enough carbohydrate can be eaten to balance the insulin and prevent hypoglycaemia.

It is essential also that every insulin patient should carry on his *person* the information that he is a diabetic taking insulin. This has always been advised in peacetime, but is much more important now. Imagine what would happen after an air raid injury to any severe insulin patient with no such information on his person. A suitable card is provided by the Diabetic Association, 124, Baker Street, London, W.1, and this or something similar should be carried *inside the national identity card*. It should state the kind and dose of insulin in units and the amount of carbohydrate per day, and the patient's usual doctor or hospital he attends. Any diabetic who neglects this runs the gravest risk.

Enforced Omission of Insulin or Food

If a diabetic cannot get his usual insulin, it is best for him, as a general rule, to continue to eat his usual carbohydrate but no fat and only a little protein. This proce-

dure is more likely to minimize ketosis than is complete starvation. A return to *insulin* and the usual diet should be made *as soon as possible*, and as an emergency is likely to arise the situation should be reported to a doctor. Extra doses of insulin may be necessary to re-establish the previous state of health, and some patients may require frequent doses of insulin and carbohydrate (perhaps four-hourly) to rescue them from serious ketosis.

If a person's insulin supplies are running short it would probably be fairly safe for a few days to economize by taking half the usual dose with the usual diet, except that *no fat* should be eaten. More value will be got out of a limited amount of soluble insulin given in three or four small doses than if it is given in one or two bigger doses per day—for instance, 10 units eight-hourly has a better effect than 30 units once a day. This does not apply to protamine-insulin, and is one advantage of the latter.

Many diabetics are very conservative about the brand of insulin they use, but they should realize that these are all the same, and should not hesitate to use any brand (that is, A.B., Boots, B.W.) if they cannot obtain temporarily their usual one. Also they may have to use a different strength of insulin for the time being—perhaps 20 units per c.cm. strength instead of 40 units per c.cm.

If insulin is available but for any reason no carbohydrate food can be got to balance it another problem arises, because the usual dose of insulin without food would cause hypoglycaemia, and the complete omission of insulin would allow ketosis and coma to develop. As a general rule a subject of severe diabetes should take one-half (certainly one-third) of the usual dose of insulin without food. It is unlikely that food would be lacking for long, and as soon as available the usual meal and insulin should be taken, or only a half-dose of insulin if within six hours of the previous half-dose.

PHRENICO-COSTAL SINUS PNEUMONIA

BY

G. R. OSBORN, M.B., B.S.

By " phrenico-costal sinus pneumonia " is meant a peculiar condition of the lateral portion of that part of the base of the lung which enters the phrenico-costal sinus of the pleura on deep inspiration. It will be remembered that during expiration the base of the lung reaches only the eighth rib in the mid-axillary line. During deep inspiration the base moves freely downwards but does not reach the tip of the phrenico-costal sinus. Many muscular efforts are made with the breath held in full inspiration —that is, with this part of the lung fixed in the phrenico-costal sinus. The portion of the lung thus fixed may be

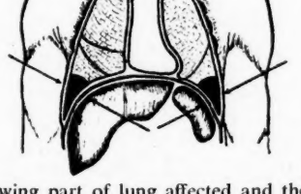

Diagram showing part of lung affected and the mechanism of production.

" caught in a pincers movement " consisting, on the right side, of the elbow and liver and, on the left, of the elbow and the spleen (see accompanying diagram, in which these forces are indicated by arrows and the part of the lung involved is shaded black).

Although this condition does not appear to have been reported previously it is probable that it is not infrequent. In the first two cases here recorded healthy men sustained a relatively trivial but peculiar injury. Their accidents were similar and were well described, and there can be no reasonable doubt that the accident was the cause of the lung condition found later. The second two cases show the same lesion in delirious patients, in whom it is probable that a similar injury took place but was not observed. No great degree of violence is needed to produce the condition. The fifth case is an air raid fatality.

Case 1.—This patient was a well-developed healthy man aged 49, weighing about 12 stone. While having his lunch at work on June 23, 1937, some boys kicked a football near him. He got up and gave it a kick to send it back, but in so doing he tripped over a heap of iron castings and came down on his right side with his elbow in by the side of his chest. The shop ambulance man dressed the elbow and sent him to the hospital, where two sutures were inserted just above the elbow. The patient then resumed work. On the 25th the ambulance man noticed he was sitting down, so he went to him " and found he was in a semiconscious condition." He was taken to the first-aid room, where he " started to groan and complain of pain in the right shoulder and down the right side." He then coughed up some blood and was again taken to the hospital, where he died from acute pulmonary oedema six hours after admission. At the post-mortem examination the injuries above the right elbow laterally were noted; there were multiple abrasions, and a deep wound was closed with two silkworm-gut sutures. There was no sign of infection, and the axillary glands were not enlarged. The heart weighed 12 oz. Except for slight dilatation it was perfectly normal; there was no valvular or coronary disease. The blood was dark and fluid. The air passages were filled with deeply blood-stained froth; a similar fluid poured from the cut surface of the lung. The lateral part of the base of the right lung (in a position corresponding with the arm injury) showed a peculiar wedge-shaped consolidation. This was very much harder than the hepatization of pneumonia, and was cyanotic, with a dry cut surface; the edges were very sharp all around and stood up from the rest of the lung. Sections revealed that there had been free haemorrhage into this part of the lung. Some phagocytic cells laden with haemosiderin granules were observed among the red cells, but most of the erythrocytes were well preserved. There was no relative increase in white cells, but some of the bronchi had many polymorphonuclear leucocytes in their lumen. The pleura over this solid part showed a light fibrinous exudate; elsewhere it was shiny. There was a large blood-stained exudate in the right pleural cavity, but the left side was clear. The phrenico-costal sinus was normally deep on the right; on the left it was obliterated by old adhesions. There was no significant lesion in the abdomen or the brain.

Case 2.—The second instance of this condition was that of a man aged 55 who on May 24, 1939, slipped at work while carrying a heavy object with another workman. He came down on his left side and " strained " his lower left chest; because of this he had to sit down for a time. He then resumed work and carried on for several days, despite his " strain." He then had to visit his doctor, who strapped his lower left chest and sent him to bed. He appeared to be making good progress until, quite unexpectedly, he suddenly collapsed and died on the seventh day after the accident. At the post-mortem examination it was noted that the left leg was moderately swollen because of a femoral thrombophlebitis. Clot from this had become detached and had caused his death by pulmonary embolism. The clot embolus was 20 cm. long and passed from the right ventricle into the right branch of the pulmonary artery, where it turned sharply across to enter the left pulmonary artery. The heart was moderately dilated and hypertrophied; it weighed 15 oz. There was no valvular disease, but moderate coronary arteriosclerosis was present. Except for the clot described the content of the heart was dark fluid blood. The left pleural cavity revealed an effusion of about one pint of blood-stained fluid; the right had no exudate, but there were some old adhesions. Both lungs showed some oedema. At the lower

part of the base of the left lung laterally there was a hard wedge-shaped lesion similar to that noted in the previous case; it had sharp outlines and felt heavy, and the cut surface was dark red. It was possible to demonstrate the mechanism of the lesion very convincingly (among others to the three doctors who attended to represent the different financial interests of the case) because there were a number of small bruises in the adjacent part of the diaphragm, and the anterior surface and margin of the spleen showed contusions and some blistering. The spleen weighed 7 oz. Nothing of interest was seen in the remaining abdominal organs and in the brain.

In the next two cases showing the lesion the patients were delirious for some days before death and had multiple small surface bruises. While these bruises show that injuries of the type described above may have taken place they were not specially observed, and so these lack some of the interest of the first two cases.

Case 3.—A man aged 62 developed neurasthenia during the war of 1914–18 and became psychotic at the outbreak of the present conflict. Several weeks before he died he was admitted to hospital with a diagnosis of "neuro-circulatory asthenia." During the course of the second week he developed an increasing delirium. On October 23, 1939, I made a post-mortem examination. The heart weighed 16 oz. It was markedly dilated, especially on the left side. The muscle of the left ventricle was wasted and fibrous, and the papillary muscles were completely atrophic. There were a few recent small vegetations on the mitral valve: no emboli from these were demonstrated. The valves otherwise were normal. Moderate coronary arteriosclerosis was present. The upper air passages were clear. The lungs showed a patchy bronchopneumonia, and at the right base laterally there was a hard wedge-shaped zone of consolidation which was heavy and stood out sharply from the surrounding lung tissue. This was of similar size, shape, and consistency to that described previously. Its measurements were: 6 cm. high, 8 cm. in the antero-posterior direction, virtually nothing at the distal tip, increasing to a maximum of 4 cm. at the upper end. The pleural surface over this wedge was shiny. Sections showed that free haemorrhage into the lung had occurred here; there were phagocytic cells filled with haemosiderin among the red cells but no collections of pus and no evidence of infection. There was no blood-stained effusion into the pleural cavity. A small haemorrhage into the neighbouring part of the liver made it clear that this case was similar to the first two described. Apart from gall-stones the remainder of the examination did not reveal anything of significance.

Case 4.—A man aged 63 had had heart trouble for a year and had taken to bed six weeks before admission to hospital. He was sent there on a "fourteen-day order" because of his delirium. On December 12, 1939, I made a post-mortem examination. His heart weighed 23 oz. and showed general hypertrophy and dilatation. The valves were normal except for great dilatation of the aortic ring from a gross aortitis of syphilitic type. There was little coronary disease and little general arteriosclerosis. Both lungs showed a sharply defined wedge-shaped lesion at the extreme base laterally. Except that it was double in this case the appearances were the same as those described in Case 3. There was only a little blood-stained fluid in the two pleural cavities. No contusions were demonstrated on the diaphragm or abdominal organs, but the chest wall was bruised over the phrenico-costal sinuses laterally. Changes in the remaining organs were of little interest.

Case 5.—A well-developed girl aged 17 was brought to hospital dead at about 3.30 a.m. The house in which she lived had been demolished by a high-explosive bomb. She was covered with the dust of the falling house. There was a fracture of the left anterior fossa of the skull. The back of the right hand showed terminal abrasions from protecting herself. There was a blood-stained effusion in the left pleural cavity and a smaller one in the right. The large air passages were filled with blood-stained froth. There were multiple small haemorrhages throughout both lungs; one in the lower part of the right middle lobe was up to 2 cm. in diameter. The most interesting haemorrhage was into the lateral part of the base of the left lung. This had the characteristic wedge shape described for the previous cases. The antero-posterior extent was 9 cm.; it extended up the lateral surface 3 cm. and over the diaphragmatic surface 6.5 cm. The lesion felt hard, had sharp outlines, and on section was dark red and solid. There were no external injuries to the chest or abdomen to be seen about here, but the abdominal component described was demonstrated by extensive tearing of the spleen with haemorrhage into the peritoneal cavity. There was no other abdominal injury. In this case the father came downstairs ahead of the mother and daughter; he had reached the head of the cellar while the two women were at the foot of the stairs. He was unhurt. The women were buried. The girl was dead when found; the mother was unconscious with a fractured skull and fractured ribs. She died next day.

Discussion

The diagram should make the site of the lesion and its mode of production clear. The movements of the diaphragm are important in the production of phrenico-costal sinus pneumonia. In expiration the lateral muscular fibres of the diaphragm lie against the chest wall and obliterate the sinus, leaving it a potential space only. Inspiration involves active contraction of the diaphragm, which therefore descends and opens the phrenico-costal sinus, the outer parts of the base of the lung being drawn into the sinus. If the breath is held at the end of this movement it is done so by a spasm of the glottis, and the diaphragm and other respiratory muscles are in the position for the beginning of expiration—that is, relaxed. In this condition the phrenico-costal sinus contains part of the base of the lung, but this lung tissue is not protected by contracted muscles. The lung thus held in the phrenico-costal sinus can then be caught between two opposing forces. The external force is the lower part of the arm (elbow) being driven into the chest as the man falls to that side; the internal force is the weight of the liver in a fall to the right and the weight of the spleen (probably aided by other organs in the vicinity) in a fall to the left. No great degree of violence is needed to injure the lung caught between these two forces. Obviously this "pincers movement" can only be applied laterally with any ease; hence the peculiar wedge-shaped lesion described is not likely to be met with anteriorly or posteriorly.

The lesion is probably fairly common, and should be diagnosed during life by radiographs if not by physical signs alone. Doubtless most of the cases recover after running the course expected of a "strain" and the opportunity of seeing the lesion post mortem must be rare. The first two cases described here are the convincing ones, because there was a good history; the death in each instance was by an unexpected complication, so that in the ordinary course of events both men would have recovered. There is no certainly fatal feature in the lesion, and death when it occurs will be due to complications.

The fifth case enables us to arrive at the mechanism of blast injuries to the lungs. To produce the phrenico-costal sinus pneumonia there has been an external force with chest and abdominal components; the latter in this case is proved by the ruptured spleen. This means that the blast effect "is due to the impact of the pressure wave on the chest wall" (Zuckerman, 1940) and, I believe, the abdominal wall as well. Zuckerman arrived at this conclusion by experiments which excluded the effects of pressure and suction waves acting through the air passages, and showed that the blast effect could be minimized or prevented by sponge rubber, etc., around the chest. The study of phrenico-costal sinus pneumonia suggests that blast effects on the lungs would be minimized if people could inhibit the tendency to take a deep breath and hold it in emergencies. This could be tested experimentally. Alternatively, it will be noted that if we accept Zuckerman's results these tend to prove the mechanism described for the production of phrenico-costal sinus pneumonia.

Strictly speaking, the lesion described is not a pneumonia but a contusion; in spite of this the most appropriate name appears to be the anatomical one of "phrenico-costal sinus pneumonia." The lung lesion has such definite features that it can be distinguished from the various types of pneumonia, etc., with ease. These features are: (1) position—lateral part of extreme base; (2) wedge shape; (3) exceptional hardness and heaviness; (4) sharply defined edges which project from the surrounding lung; and (5) dry and dark red cut surface. Other signs of contusion should be looked for. These are: (i) injuries to the elbow and chest wall near by; (ii) a blood-stained pleural effusion with or without flakes of fibrin on the pleura over the lung lesion; (iii) contusions of the diaphragm; and (iv) contusions of the liver on the right side and of the spleen on the left.

The first four post-mortem examinations recorded here were made on the instructions of the Coroner, Major T. H. Bishop, to whom I am indebted for permission to publish the reports. Inquests were held on the first two cases, verdicts of "Death from misadventure" being returned.

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Clinical Memoranda

Obstructive Jaundice due to Stricture at the Junction of Right and Left Hepatic Ducts

Years ago I described a case of simple obstructive jaundice with huge dilatation of the common duct (Burman, 1912, and am now satisfied that it was similar to the cases described by Sir James Walton (1939).

The following case is of interest because post-mortem findings cleared up the pathology—namely, a stricture at the junction of the right and left hepatic ducts, with dilatation of these ducts to the extent of admitting two fingers.

CASE REPORT

A male European aged 46 consulted me on September 13, 1939, and gave the following history. Six weeks previously he had been suddenly seized with acute generalized colicky pains over the whole abdomen that made him vomit. The vomit was greenish and watery. These attacks occurred daily for a week, then ceased, and were followed by jaundice, which gradually deepened. He noticed that his stools were clay-coloured and that his urine was very dark. Flatulence, heartburn, and abdominal distension were troublesome after food, and he complained of cramp-like pains in the calves and tingling of the fingers and toes. Itching was very troublesome, and incessant scratching had produced minute ulcers on both ankles. He was very depressed and lethargic. On examination deep jaundice was evident, and the liver was considerably enlarged. No clinical signs other than those stated in his history were noted. Tentative treatment having been given for a short while without improvement, he was admitted to Greys Hospital for thorough investigation, under my care.

Further questioning now elicited that the patient had a heavy alcoholic history, and for years had had a peculiar feeling of sickness over the xiphisternum after meals. He had contracted malaria during the war of 1914–18, his last attack occurring five years ago. On admission his weight was 131 lb. and his blood pressure 100/70.

The following data were obtained from tests made: (1) Motions: no unsplit neutral fat, a few fatty acid crystals, and no undigested meat fibres. (2) Urinary diastase, 32 units. (3) Wassermann reaction negative. (4) Van den Bergh test: direct prompt positive. (5) Icterus index, 96 on October 13. (6) Blood count: haemoglobin, 80%; R.B.C., 4,200,000 per c.mm. (halometer reading normal); colour index, 0.95; white cells, 5,800 per c.mm.—polymorphs, 61%; lymphocytes, 27%; monocytes, 5%; eosinophils, 6%; basophils, 1%. (7) Radiographs of the gall-bladder region revealed no evidence of opaque stones.

The patient was put on a fat-free high-carbohydrate diet with glucose and insulin from September 22 to October 2 without any result. Medinal was given for relief of itching. Hexamine, 40 grains daily, was tried for a few days.

Owing to the paucity of clinical findings other than the jaundice, itching, and enlarged liver, my provisional diagnosis lay between an ordinary catarrhal jaundice and a growth (papilloma) in the common duct. Against catarrhal jaundice was the enlarged liver and the entire absence of a palpable gall-bladder, and at the end of four months no evidence of diminution of the jaundice was apparent except that occasionally the urine was not so dark. Weight was gradually lost. Before deciding on exploratory laparotomy the patient was shown at a clinical meeting in the hope that some suggestions might accrue from argument. The diagnosis I had now made was a papilloma causing obstruction in the common duct above the junction of the cystic and common ducts. At the meeting, cirrhosis of the liver due to alcohol was mostly favoured, or the possibility of a stone in the common duct.

On November 21 an exploratory laparotomy was undertaken under oxygen–ether anaesthesia. The gall-bladder was found empty and shrivelled; the head of the pancreas was firm but not unduly hard, and the common duct neither enlarged nor distended; palpation revealed no growth or stone. There were a few enlarged glands in the portal fissure; one of these was removed for examination, and on section appeared to be merely inflammatory. (Later, microscopical section showed hyperplasia only.) It was deemed advisable to close the abdomen in view of the negative findings. The patient died during the early hours of the morning following the operation.

Post-mortem Examination.—After considerable difficulty a limited examination was obtained. The liver, pancreas, portion of stomach, and duodenum were removed *en bloc* and the common duct opened from the duodenum upwards to the junction of the right and left hepatic ducts. A stricture, admitting a small probe with difficulty, was encountered. On division of the constriction a large quantity of bile escaped from the greatly dilated ducts. Two fingers could easily be admitted into either duct. Careful examination of the stricture showed thickened tissue only. The spleen was normal. Two handfuls of clotted blood was found in the abdomen, otherwise no abnormality was noticed.

Pathological Report.—Prof. Ryrie of Capetown reported as follows: "The hard tissue found around the duct is only fibrous tissue. The section of liver appears to me to be very difficult to interpret. There is the obvious evidence of obstructive jaundice; the bile globules are not in the cells about the portal tract, however, but in irregular foci and often about the area where the central vein should be, and in injured cells. All this may well indicate that the obstruction in the liver followed upon a hepatitis, so called, or liver necrosis. Or is the liver necrosis secondary to the jaundice? The clinical story is against this. There is, of course, also some cirrhosis, but it is hardly significant. The section from around the dilated duct again shows much necrosis, but hardly any other lesion to account for the obstruction."

COMMENTARY

The post-mortem findings and a careful survey of the history, especially the sick feeling in the xiphisternal area and, later, constant flatulence and indigestion, suggest the possibility that the stricture was congenital and that the patient's alcoholic proclivities produced a certain amount of cirrhosis, which as time went on caused narrowing of the stricture and, finally, a sudden block with onset of jaundice, similar to the typical history obtained in cases of stone. It

was unfortunate that he never consulted me until the jaundice had been present for six weeks, as no record of the size of his liver before the attack was obtainable.

My thanks are due to Prof. Ryrie for his pathological report, to Dr. Baikie for performing the operation, and to Dr. Cowie for the post-mortem examination.

Pietermaritzburg. C. E. L. BURMAN, M.B., B.S.

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Diagnosis of Intussusception before Blood and Mucus appear in Stools

The following case illustrates how a certain diagnosis of intussusception in children may be made before the onset of inflammation, which leads to the appearance of blood and mucus in the stools. These two features in the stools are considered in standard textbooks almost essentials to diagnosis.

CASE RECORD

A child aged 2 was seen in consultation for intractable vomiting, which had been in progress for fifteen hours. There was no elevation of temperature. The bowels had acted during the previous twelve hours and the stool was normal. Spasmodic retching occurred almost hourly, and between times the child lay limp and apprehensive. Abdominal pain was not a prominent feature.

On first examination of the abdomen nothing abnormal was felt. The vomiting had been so persistent that the suspicion of some obstruction in the bowel was naturally strong. A second examination of the bowel through the anterior abdominal wall again failed to reveal any abnormality. It was only upon a third abdominal palpation, made some minutes later, that an elongated mass was found on the right of the abdomen. This sausage-shaped tumour was distinguishable only when the bowel was in contraction, and this occurred about every four or five minutes. At other times no evidence of the mass could be detected. No retching accompanied the peristalsis.

Mr. Hermon Taylor was called in for a surgical opinion. He examined the abdomen and declared he could feel nothing abnormal. He was invited to make repeated examinations, and in one of these a cylindrical mass was felt to harden and remain firm for a few seconds, after which the mass subsided and became no longer discernible. Operation was decided upon at once, and an intussusception of the ascending colon about six inches in length was found. The intussusception was easily reduced by gentle traction, there being no peritoneal exudate and little congestion. Recovery was uneventful and there was no recurrence.

This note is published to draw attention to the fact that it is possible to diagnose intussusception with confidence before peritonitis has set in and before blood and mucus are discharged per rectum. These classical signs represent the advanced stage of inflammation, when the intussusception has become a congested tumour which persists. As shown above, there is an early stage when the intussusception is a palpable tumour only during actual contraction of the musculature of the bowel. This intermittent tumefaction or intumescence probably coincides with the actual advancement of the intussusception. This would seem to be a reasonable assumption, since we know that the intussusceptum is propelled by peristalsis. If these assumptions have reality in fact, then we may assert that in every case of intussusception there is a stage when the tumour exists only intermittently. This stage occurs soon after the intussusceptum enters the intussuscipiens, and it coincides with the symptom of intractable vomiting, which is pronounced only at the onset. If the surgical treatment of intussusception were carried out during this stage of the intermittent tumour, mortality from the condition would practically cease. The key to the early diagnosis of intussusception in children lies in the *repeated* examination of the abdomen for an intermittent tumour in all cases of sudden and intractable vomiting.

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Reviews

THE NATURE OF DISEASE

The Universe Through Medicine. By J. E. R. McDonagh, F.R.C.S. (Pp. 389. 25s. net.) London: William Heinemann (Medical Books), Ltd. 1940.

For close upon thirty years Mr. McDonagh has been an enthusiastic and indefatigable worker along his own special lines. By this time his views on the unity of disease and the dehydration and hydration of protein particles are fairly well known if not entirely comprehended by the medical profession. He now feels that his conclusions can be applied to solving the riddle of the universe, but before trying to accompany him on a celestial flight we must realize that it would necessitate leaving the comfortable habitation which has been steadily built up for us by physicists, chemists, physiologists, biochemists, and bacteriologists. For there must be no mistake about that. If Mr. McDonagh is right all this body of workers must be wrong. We are not competent to criticize his physics—which is perhaps not surprising, because he says he does not understand physics as ordinarily presented. But it is a severe demand to make on us to "regard the function of the red blood corpuscles to attract activity from the air and to convey it to the protein particles," which is either a different way of expressing the function of haemoglobin or involves throwing over all that has been believed since the days of John Mayow and Lavoisier. To ask us to look upon his "protein particles" as composed of an outer shell of polysaccharides, an inner shell of hydrocarbons, and a core of protein is to ask something which, so far as we know, biochemists would not accept. To expect us to regard hormones as merely waste products is difficult in view of the triumphs of thyroid medication and insulin therapy.

Two arguments have been urged in favour of Mr. McDonagh's theories: one is that they have enabled him to introduce certain chemical agents which many practitioners believe to have therapeutic value. But we must remember that it is by no means uncommon for a drug to be found empirically useful although the wrong theory of its action has been held. Thus, for instance, the use of valerian was advocated on what now seems to be preposterous grounds, though it must be admitted that if these are translated into terms of Freudian symbolism they do not look quite so ridiculous. The other argument is that great discoveries of the past were for a time rejected; to which the corollary seems to be that if a theory is not accepted it must be true. This is fallacious logic; the history of the past is strewn with the wrecks of many theories which were not accepted and have passed into oblivion.

We may therefore fairly ask that the exponents of the sciences on which medicine is based should be convinced of the correctness of Mr. McDonagh's views before we can rebuild our medicine upon them. Recent developments have shown that the medical profession is not slow nowadays to take up new ideas. Insulin therapy, the sulphonamides, and the Trueta method of treating wounds are examples of this. If Mr. McDonagh can convert such exponents we do not think he would have reason to complain of the deafness of the medical profession to his teaching. But unless and until that happens we feel justified in suspending judgment.

OPERATIVE SURGERY IN BRIEF

Synopsis of Operative Surgery. By H. E. Mobley, M.D., F.A.C.S. (Pp. 375; 339 text illustrations, including 39 in colour. 21s. net.) London: Henry Kimpton. 1940.

A new *Synopsis of Operative Surgery* has been written by Dr. H. E. Mobley of Arkansas, intended for the use of students preparing for their qualifying examination. The book covers the whole field of operative surgery, including sections on the eye, ear, nose, and throat, and gynaecology, but, although the description of each operation is a synopsis in itself, to compress the whole of the subject into the compass of 360 pages has necessitated the use of a rather small type and uncomfortably condensed format—one reason for this is that every page has one or more illustrations occupying a considerable amount of space. Any textbook of operative work should have an abundance of good illustrations, such as are found here, but we feel that the effort to get *multum in parvo* has been overdone for a student's book and that it might have been wiser to leave out some of the rarer operations so that more space could be devoted to the commoner ones.

The descriptive matter is of good quality, but we notice what must be a deliberate attempt, since with few exceptions it is uniform throughout the book, to abandon the long-established practice of calling certain operations after the name of their originators (McBurney and Thiersch, however, appear). It is arguable that the association of a name with an operation helps to introduce the human element, so making the subject more interesting, and as the student advances in his studies he is certainly helped to an understanding of the historical side of the evolution of modern operative technique. The fact that the present-day method of performing a classical operation does not always correspond step by step with that of the originator in no way alters this belief, for frequently what the author originally described was the general purport of the operation together with his own method of achieving this end, without any implication that the details might not be subject to modification as required. Nor is the impersonal manner of designating operations any more accurate descriptively; in this volume, for instance, what is usually designated as "Syme's amputation" is called "disarticulation at the ankle-joint"—an inaccurate name for one type of low supramalleolar amputation. This point gains further emphasis when it is discovered that the description given of the operation follows very closely that of the original Syme amputation and not one of the modern, and possibly improved, modifications of the classic.

Despite these criticisms we think this will prove a useful book for the student wishing to revise very briefly the field of operative surgery.

RADIOGRAPHY

Roentgen Technique. By Clyde McNeill, M.D. (Pp. 316; 268 illustrations. 27s. 6d.) London: Baillière, Tindall and Cox. 1939.

Dr. Clyde McNeill has written a practical and informative handbook on radiography. In its 300 pages he has managed to pack a surprising amount, and the illustrations and photographs of the patient in position, and line drawings of the resulting radiographs, are commendably clear. In many of the radiographic procedures the illustrations tell the story so accurately that the accompanying descriptions are hardly necessary.

The first part of the book is devoted to the head, and is really good. The only criticism one could fairly offer is that the erect position is not recommended for the accessory nasal sinuses. American technique differs, however, in this respect from British. In the section on the extremities one or two of the illustrations could be improved upon; for example, the plantar flexion shown in the ankle in Fig. 141 would prevent a clear view of the ankle-joint, and in Fig. 151 the knee-joint is not sufficiently flexed. Only one view for the clavicle is described, that with the patient prone—an impossible position for a fracture of that bone. The alimentary canal and chest, lying more within the province of the radiologist than the radiographer, are briefly dealt with.

Exception must be taken to the statement that "upright films are usually made to determine if there is any kinking of the ureters due to ptosis." This view of the cause of Dietl's crises is surely rather out of date. Tomography is described, but no mention is made of the Twining simplified apparatus, which in this country at least has quite superseded the original expensive types of plant. In the last section a routine gastro-intestinal examination is described. It could with advantage be amplified. In spite of these minor faults this book can confidently be recommended to radiographers and students of radiology as a practical outline of radiographic technique.

THE SUPRARENAL CORTEX

Die Funktion der Nebennierenrinde. By F. Verzár. (Pp. 266; 16 figures, 4 plates. 25 francs.) Basle: Benno Schwabe and Co. 1939.

This book on the functions of the suprarenal cortex, by Professor Verzár of Basle, is a very important monograph, because it contains a full exposition of the author's theory regarding the fundamental action of these glands. During the past five years he has published a series of articles which prove that cortin is essential for the phosphorylation of glucose. This process is necessary for the selective absorption of glucose from the gut and for the formation of glycogen from glucose. Hence removal of the suprarenal cortex deranges carbohydrate metabolism and in particular prevents the restoration in muscles of glycogen removed by exercise. The breakdown of glucose phosphorylation is connected with a failure to form lactoflavin phosphate, and the author suggests that the basic derangement of function caused by cortin deficiency is the inability to form the yellow respiratory enzyme from vitamin B_2. This leads to a general derangement of cellular metabolism which in certain respects resembles the disturbance produced by poisoning with phloridzin and iodo-acetic acid. The next phase is a liberation of potassium, a cumulation of potassium in the plasma, and a compensatory loss of sodium. These changes produce plasma loss and ultimately death from shock.

The relation between the suprarenal cortex and other endocrine glands is also discussed. Removal of the anterior pituitary gland causes atrophy of the cortex, and the author suggests that certain of the metabolic derangements following hypophysectomy are secondary effects due to decreased activity of the suprarenal cortex. The relation between the suprarenal cortex and the gonads is only partially understood. Corticosterone closely resembles the hormones in its chemical structure, and progesterone has a corticosterone-like action. Furthermore, the suprarenal cortex is essential for the normal production of sex hormones.

Verzár's hypothesis may well mark a real advance in our knowledge of some of the most difficult problems of endocrinology, and it is to be hoped that before long an English translation of this monograph will be provided.

STARCH

Starch and its Derivatives. By J. A. Radley, M.Sc., A.I.C. Being Volume XI of a Series of Monographs on Applied Chemistry. Under the editorship of E. Howard Tripp, Ph.D. (Pp. 346. 22s. net.) London: Chapman and Hall. 1940.

This book by J. A. Radley is a remarkable contribution to scientific literature. It describes the chemical and physical properties of all the different varieties of starch of which technical use is made; the products which are prepared from them and the relative suitability of these products for the uses to which they are applied.

Among the features which render the book remarkable is the astonishing volume of learning, both scientific and technical, which has emerged from the study of starch, the many industrial purposes which starch is made to serve, and the variety of methods whereby a given purpose may be fulfilled. All these matters are fully discussed, and the discussion treats freely of the relative advantages and disadvantages of different principles of procedure. Even by-products assume a considerable importance in the economy of starch.

It seems hardly possible that a question could be asked about starch to which the book does not give an illuminating answer.

Notes on Books

A set of lectures mainly devoted to food in wartime were delivered at the Royal Institution in April, May, and June by Prof. J. C. Drummond, Sir Robert McCarrison, Sir John Orr, Sir Frederick Keeble, Dr. L. H. Lampitt, Prof. V. H. Mottram, and Dr. J. C. Spence. Abridged versions of these lectures appeared in the *British Medical Journal* soon after their delivery, and the full text is now published by G. Bell and Sons, Ltd., in book form under the title *The Nation's Larder and the Housewife's Part Therein* (price 2s. 6d.). The volume includes a letter from the Minister of Food (Lord Woolton), a preface by Sir William Bragg, P.R.S., Director of the Royal Institution, and a supplementary chapter on the artificial preservation of food, by Dr. Franklin Kidd.

When Prof. A. J. CLARK'S *Applied Pharmacology* first appeared in 1923 the late W. E. Dixon wrote that this book "contains the groundwork of the rationale of treatment; it makes delightful reading and should prove of great interest to all those who treat the sick." The praise then accorded was well earned, and the book has now reached a seventh edition, to say nothing of two reprints, and has been translated into Spanish and Chinese. The new issue (J. and A. Churchill; 21s.) reflects the rapid advances in pharmacology and the changes in therapeutic practice that have taken place in the last few years. The text has been revised and there are new chapters on the action of the sulphonamide drugs and on the pharmacology of the haemopoietic system. Reviewing the history of chemotherapy Prof. Clark says that the development of this subject through the present century is the most important therapeutic advance made in the history of medicine; the only other advances of outstanding importance are the development of endocrinology and the knowledge of vitamins during the same period.

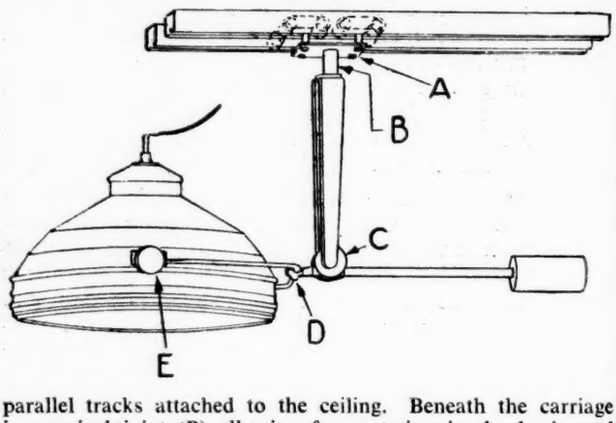
The title *Common Mistakes of Surgery in India* for a book might lead one to expect that it would deal exclusively with those special errors associated with surgery in tropical regions. In fact the volume by Lieut.-Colonel A. N. PALIT, F.R.C.S.Ed., I.M.S. (ret.), epitomizes surgery in general, while mentioning most of those mistakes in surgical diagnosis and treatment common the world over. It is written in an elementary and colloquial style, but for a book of this type the author is too prone to indulge in stories of his own career and experiences, not always helpfully. Nevertheless for the student and the newly qualified man there is a good deal of guidance to be found here which will help them to avoid the major errors of surgical practice. It is published by the Book Company Ltd. of College Square, Calcutta, at 8s. 6d.

Preparations and Appliances

SHADOWLESS LAMP WITH UNIVERSAL RANGE

Mr. H. T. FLEMING, F.R.C.S. (Enniskillen), writes:

The following description of the apparatus recently installed in the Fermanagh County Hospital may be of interest. It has been designed to overcome the lighting problems associated with a small theatre, but whether the theatre be large or small it is evidently better to be able to move the lamp to suit the operative field than to move the table to suit the lamp. The features embodied in the lamp described are: (1) universal range, (2) stability, (3) ease of movement. The diagram illustrates all the essential features. The lamp is suspended from a carriage (A), the sixteen roller wheels of which run in two



parallel tracks attached to the ceiling. Beneath the carriage is a swivel joint (B) allowing free rotation in the horizontal plane. Two flat bars lead down to a double friction joint (C) in which the lamp arm is held. This arm is provided with a joint (D) allowing 180 degrees rotation. Lastly the stirrup joints (E) allow free rotation on their axis.

It will be seen that the lamp is counter-weighted, and its excellent balance allows it to be very easily moved into any position. Furthermore, the arrangement effectively eliminates any oscillation. The range of movement in the vertical plane is about two feet, the minimum lamp height from floor level being 4¾ feet, so that the arrangement is easily adapted to the lithotomy position.

The apparatus has been constructed for me by Messrs. Kelvin Bottomley and Baird, Cambridge Street, Glasgow, to whom I am indebted for their valuable assistance, and also to Mr. Sterling Maguire, Enniskillen, who was largely responsible for the design.

REMOVAL OF SEMILUNAR CARTILAGE BY SNARE

Lieutenant-Colonel R. RUTHERFORD, R.A.M.C., writes: The usual incision is used sloping downwards and backwards from the edge of the patella. The cartilage is freed in the usual way and drawn into the middle compartment of the joint. An Eve tonsil snare is threaded over the cartilage, which is pulled forward by a pair of Kocher's forceps; the snare aperture is gradually closed, which facilitates maximum entry of snare tunnel. When the level of the posterior horn attachment is reached the cartilage is removed by closing the snare completely. Occasionally the cartilage is too tough to be bitten through by the wire. In these cases the snare is used as a clamp and the cartilage is removed by cutting posterior to the snare wire. It is claimed by this method to be able to remove more of the cartilage than by the orthodox method.

PHENOBARBITONE AND BROMIDE TABLOIDS

Phenobarbitone and bromide (Messrs. Burroughs Wellcome and Co.) are tabloids which contain soluble phenobarbitone 1/3 gr. and potassium bromide 7 gr. The preparation is intended for producing cerebral depression in such conditions as hyperexcitability of the motor cortex, nervous insomnia, thyrotoxicosis, etc.

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LONDON
SATURDAY SEPTEMBER 7 1940

FEAR, DISTRUST, AND HATE

Historians in the future may note with interest that, whereas the nineteenth century, which began so gloomily, proved to be one of the most stable and progressive, the twentieth century, which opened auspiciously, was soon involved in violence. That at this stage of civilization two devastating wars should have occurred in a quarter of a century has naturally interested psychologists also. Dr. Edward Glover has already probed some of the deep unconscious influences that urge men into such obviously irrational conduct,[1] and now in his booklet on the psychology of fear and courage[2] he has explained in non-technical language the instinctive responses excited by this conduct. He points out that to understand the origin of our motives may well strengthen morale by helping us to detect and control those unreal alarms, suspicions, and superstitions which tend to make us weak-kneed and infirm of purpose during a crisis. For Hitler's real "secret weapon" is his conviction that the first thing to do with an enemy is to demoralize him, and the present state of the Continent is proof of its efficacy. Our morale is one adapted to peacetime, which allows of the scattering of energy, whereas we now have to acquire even greater unity of purpose than the enemy.

Physiologists have shown that fear is developed from a perfectly reasonable defensive mechanism; psychologists inquire into its unreasonable, pathological manifestations. To be attacked from the air without any chance of retaliation is a severe test of nerve, and in this respect the untrained civilian is much worse off than the soldier. He is not part of an organized group; he has to cultivate self-discipline and to recognize that unreal fears are mostly a legacy from childhood. Useful action and vigorous preparation to meet real danger will enormously reduce these unreal fears, especially if such preparation forms part of a communal effort. Mutual aid is one of the most sustaining forms of human activity. Everyone tends to react to danger according to his temperament. The fussy man with a tendency to excessive precaution probably has a sympatheticotonic make-up, while the one who, faced with sudden danger, behaves in a passive, almost hypnotized manner is probably vagotonic. The over-fatalistic type sometimes has an inner sense of guilt which makes him feel he does not deserve to escape. Others mingle curiosity with their fatalism and dash into danger, largely due to a pride which will not admit that they are afraid. Some, again, are really of a self-sacrificing nature, and although they will not take care of themselves they are ready to take care of others. When Boswell remarked of some behaviour of Dr. Johnson, "That, Sir, was great fortitude of mind," Johnson replied, "No, Sir, stark insensibility." Certainly the more imaginative are liable to suffer more than the prosaic.

By every means in his power Hitler seeks to break the bonds that hold us together; this policy has been deliberately followed in international diplomacy, in war strategy, in local fighting tactics, and in civilian propaganda. Hence the importance of doing everything in our power to eliminate causes of distrust—in particular, social and economic inequalities. It is often said that German propaganda tactics are childish; and so in many ways they are. But we are all in some way or other subject to childish fear; and never more so than in wartime. Man has always been unduly afraid of noise; it is the earliest cause of fear in a baby. The records of Tacitus (whose name is suggestive of his dislike of noise) tell us how from early days Germans have exploited noise to disturb their enemies, and it is their method still. Hence the psychological value of ear-plugs. Rumour is really another form of noise; did not Virgil describe it as having "a hundred tongues, a hundred mouths, a voice of iron"? Even whispered rumour tends to excite fear, and the only remedy is fuller information. Dr. Glover regards "the Quisling" as usually suffering from a strong feeling of inferiority combined with a grudge against his own kind and an inner conviction that he will never cut a notable figure in his own country. So he is tempted to curry favour with the enemy by treason. There is a good deal of submissiveness in his make-up; hence his satisfaction in bringing about the wholesale subjection of others. It would, of course, be distinctly unfair to suggest that all realistic criticism in wartime is treason. The acid test is whether such criticism is constructive or merely destructive. Nothing would spoil morale more quickly than the stifling of genuine, helpful criticism. Mr. Churchill was wise to disband the "Silent Column," a striking ineptitude of the Ministry of Information. We have gone far to re-establish the inalienable right of the Briton to grouse.

At one stage in the last war spy-mania was rampant: the concrete floor of any alien's garage was suspected to be a gun emplacement. This time it has been checked by the reaction against indiscriminate and wholesale internment. Spy-mania and scapegoat-hunting are not healthy signs; they are proofs that suspicion has broken out in ourselves. Although it has been said that nothing cements friendship between members of one group so much as a common hostility to members or an individual of another, hate is a sterilizing, disruptive force in the long run, which by stimulating fear, superstition, and suspiciousness contributes to lowered morale. It became a commonplace in the last war that hate varied directly with the distance from the front line. Except when outraged by the machine-gunning of women, children, and wounded, the soldier's attitude is usually that of a man with a job, an attitude reinforced nowadays by the fact that fighting is so impersonal—a thing of knobs, levers, and rangefinders. So much so that the modern fighter no more hates his quarry than a sportsman who enjoys killing partridges. This impersonal lessening of hate unfortunately brings with it, however, a lessened sense of pity and a blurring of the values of human life. We would remind Dr. Glover, nevertheless, of the rescue work of our sailors and airmen in the face of machine-gunning by the compatriots of those they are trying to save.

[1] *War, Sadism and Pacifism.* Allen and Unwin. 3s. 6d.
[2] *The Psychology of Fear and Courage.* Penguin Books. Price 6d.

PHYSICAL TRAINING

On the eve of its rising for a short recess the President of the Board of Education told the House of Commons that he was appointing a "small directorate to secure the further development of physical training and recreative work among young people of both sexes." The youth branch of the Board of Education and the War Office are to co-operate in this matter, and their principal concern will be with the 14–18 age group. Local education authorities and appropriate voluntary organizations are to be consulted, and there is to be no element of compulsion in the movement. The proposal has already been generally welcomed, and it will be broadly approved by the British Medical Association and the medical profession. It is indeed a further step in the direction of accomplishing the purpose and implementing the recommendations of the Association's Physical Education Committee, whose report was issued four years ago. That report should be of considerable value in this connexion, though it was concerned also with the physical education of those below the school-leaving age and with those above the age of 18.

At the time of the issue of that report careful investigation showed that probably not more than one-quarter of those within the age group concerned were participating in any properly organized form of physical training. Since then important developments have taken place. The Central Council for Recreative Physical Training, then recently established, has effectively extended its activities in several directions. The raising of the school-leaving age has unfortunately had to be postponed, but youth committees of local education authorities have been set up and in many counties and county boroughs practical provision has been made in the required direction, often as part of the activities of the community centres either newly established or more adequately aided from public funds. Conscription for military service from 18 years of age has been enacted for men. All these things have no doubt led to an increase in the number of those whose physical welfare is receiving attention, have opened widely the opportunities for physical exercise and instruction, and have increased the willingness of youth of both sexes to take advantage of such opportunities. Yet in spite of this and of the evident desire of young persons generally to be fit to render public service in the country's emergency, it is probable that much more than one-half of this age group are not having any proper form of physical education. The need for further effort is therefore evident and urgent. Some degree of compulsion, with appropriate safeguards and provision for exceptions, may be found necessary. The movement is not merely one for the emergency. It is to be continued after the war; and after the compulsory school attendance age is raised to 15 years it may be found both reasonable and advantageous to make similar provision for some form of part-time education to be continued till the age of 18 and to include recreative physical training. It is understood that the President's proposal will be discussed in the House of Commons shortly after its sittings are resumed. Let us hope that such discussions will be neither perfunctory nor merely eulogistic. Details are important, and there are certain dangers against which there should be complete safeguards.

The first of these dangers is isolation. Muscular strength and balanced movement do not constitute fitness in and by themselves. The first sentence in the B.M.A. report—indeed the first few paragraphs of that report under the heading "The Aim of Physical Education"—cannot be over-emphasized. "The aim of physical education is to obtain and maintain the best possible development and functioning of the body, and thereby to aid the development of mental capacity and of character." The training of character, the promotion of mental alertness, the acquirement of adequate knowledge, are all of them factors of "fitness" even more important than physical well-being. There need be no rivalry between these factors, but it is of primary importance that they should be combined, not segregated. Intimate connexion with the other work of the Board of Education and of local education committees is therefore essential, as is that with those main national voluntary organizations which concern themselves with the welfare of youth. A second danger is standardization. The requirements of different parts of the country and different classes of young persons are not identical. This is obviously the case with agricultural labourers, certain industrial occupations, and domestic workers. Central organizations controlled by Government Departments have a tendency to promote an undue uniformity. A certain minimum of standardization there must perhaps be; but in this matter freedom and variety are essential or the plan will not attract those whom it is desired to train or fulfil its objects with those who submit to training. A third danger is militarization. The movement should from the beginning be kept as distinct as possible from any idea of training for military service. It is true that in present circumstances it is impossible not to have in mind the effect of after-school physical training on preparedness for military service, and there is no doubt that it will be beneficial in this direction, but this should not be its main ostensible or real object, or it will ultimately fail. The proposal in its present form apparently involves the appointment to the directorate of a liaison officer from the War Office. As a temporary arrangement this may be advisable or inevitable, for the chief desideratum at present is instructors, and these are mostly in the Forces either as professional soldiers or as recent recruits. The old type of drill-sergeant is happily obsolete, or at least obsolescent; but the need of youth is not for drill but for leadership, and this requires the possession of natural powers and characteristics which have no essential connexion with military service. The fourth danger to which attention should be given is the lack of medical guidance or supervision. In schools this is provided for and is usually exercised. In after-school physical training it has hitherto been conspicuous only by its absence or inadequacy. Both in the planning of exercises, in general instruction in personal hygiene, and in watchfulness as to the suitability of exertion in individual cases the co-operation of medical officers and medical practitioners is essential, and there is a very large opportunity for this development.

The attention of Members of Parliament, and especially of the medical members, may well be drawn once more to the important findings and suggestions contained in the report of the British Medical Association's Physical Education Committee published in 1936, and no doubt such considerations as those set out in this article will be borne in mind.

INFECTION WITH HAEMOLYTIC STREPTOCOCCI OF VARIOUS GROUPS

The classification of haemolytic streptococci devised by Lancefield[1] makes use of a precipitin reaction dependent on the presence in the streptococci of a group-specific carbohydrate obtainable by acid hydrolysis. The majority of human streptococcal infections are usually regarded as being due to organisms of Group A, a close correlation existing, as was first shown by Dawson and Olmstead[2] in America, and later by Butler and Hill[3] in Australia, between the degree of encapsulation and the virulence, highly pathogenic organisms possessing well-developed capsules. Streptococci other than those belonging to Group A may, however, be found in the human body. Green,[4] for instance, isolated from the throats of 116 out of 200 patients with acute rheumatic fever haemolytic streptococci of Group A in 87, B in 3, C in 5, and G in 5% of cases, while from the throats of fifty-nine out of 200 normal persons the results were Group A in 42, B in 15, C in 27, D in 2, G in 11, and H in 3%. Since a considerable proportion of haemolytic streptococcal infections are due to contamination with organisms derived from the throats of carriers, it is perhaps not surprising that haemolytic streptococci of groups other than A should sometimes be found to be associated with disease in man. In the case of puerperal infections, however, Colebrook and Kenny,[5] and Colebrook and Purdie,[6] working in London, observed only eleven infections (6.47%) due to streptococci of groups other than A in a series of 170 cases of haemolytic streptococcal infection, two being due to Group B, two to Group C, four to Group G, and three to anaerobic haemolytic streptococci. Rather different results, however, have been obtained in Australia, where an extensive series of cases has recently been investigated by Hill and Butler.[7] Among 108 patients with puerperal infection from whom streptococci were isolated, eighty-two (25.9%) were infected with Group A strains, twelve with Group B, ten with Group C, and six with Group G. Four patients infected with Group B haemolytic streptococci died; one case was moderately severe, and seven were mild. One of the fatal cases had a pleural effusion, and thus resembled one of the cases of Group B infection described by Fry,[8] in which there were subphrenic and multiple liver abscesses. Two other fatal infections had endocarditis resembling the other two fatal cases reported by Fry. Infections in Australia due to Group C haemolytic streptococci were all mild, though it appears that very occasionally this type may cause severe infections. The Group G infections, too, were mild, but I. Macdonald,[9] also from Melbourne, has reported one very severe case following septic abortion. Macdonald has incidentally described two instances of Group G infections in which infective endocarditis caused death. Neither of these cases occurred after childbirth or abortion, nor did a suppurative arthritis of the left knee and metacarpo-phalangeal joints due to a Group B strain reported by Rantz.[10] Haemolytic streptococci belonging to Group F have been found by Long, Bliss, and Walcott,[11] and also by Hare[12] with some frequency in the throats of persons with glomerulonephritis. Their aetiological significance is still uncertain. In animals infections due to Group A streptococci are rare, but Group B and, to a lesser extent, Group C organisms have been found associated with bovine mastitis, while Group C streptococci have been isolated from horses with strangles. Group G haemolytic streptococci are by no means uncommon secondary invaders in dog distemper. Observations on the groups of haemolytic streptococci responsible for the infection of war wounds should be of considerable importance, since chemotherapeutic compounds of the sulphonamide type have so far been found to be most efficient in the treatment of infections caused by Group A haemolytic streptococci.

[1] *J. exp. Med.*, 1933, **57**, 571.
[2] *Science*, 1934, **80**, 296.
[3] *Med. J. Austral.*, 1940, **1**, 222.
[4] *British Medical Journal*, 1938, **1**, 1147.
[5] *Lancet*, 1936, **1**, 1279; **2**, 1319.
[6] Ibid., 1937, **2**, 1237.
[7] *Med. J. Austral.*, 1940, **1**, 293.
[8] *Lancet*, 1938, **1**, 199.
[9] *Med. J. Austral.*, 1939, **2**, 471.

VITAMIN B_1 AND POST-DIPHTHERITIC NEURITIS

Arguing that the child needs relatively more vitamin B_1 than the adult and that an acute illness may reveal a latent deficiency, Paul v. Kiss of Budapest[13] goes on to consider the therapeutic value of this vitamin in certain nervous diseases of children. His most striking results were obtained in three cases of post-diphtheritic palsy. The usual method employed was to give daily injection of 10 to 20 c.cm. of 20% glucose solution to which a vitamin B_1 preparation had been added. The dosage was between 2 mg. and 20 mg. A start was always made with 2 mg., and the dose was gradually increased daily until the "desired maximum" was obtained, although it is difficult to discover how this was determined, as treatment was continued for several days after definite improvement had begun. No toxic effects were observed. In all three cases prompt clinical recovery began within a few days and proceeded rapidly. Kiss suggests that in every severe case of diphtheria, especially when feeding is difficult and intravenous glucose solution is given, it is advisable to add vitamin B_1 to prevent a deficiency developing and thus, possibly, neuritic complications. Of his three cases two were complicated by heart changes and one by typhoid fever. The diaphragm and respiratory muscles appeared to have escaped in the Budapest series, but L. Frey,[14] writing from Frankfort, has found vitamin B_1 of particular value in post-diphtheritic diaphragmatic paralysis. Indeed, Frey is inclined to believe in an almost specific action on the nerve supply to the diaphragm and to deny that there is yet sufficient evidence for the use of vitamin B_1 in the treatment of post-diphtheritic paralysis elsewhere. He has collected cases from the literature and added eighteen new ones from the Frankfort clinic. The usual dosage appears to have been 2 mg. of vitamin B_1 given either intravenously or intramuscularly or by both routes, once or twice or more daily for a total dosage varying from 8 mg. up to 480 mg. There were remarkably rapid results in some cases, and in others a dramatic improvement at the last moment. Prophylactic small doses did not appear to be of much value in preventing diaphragmatic paralysis, and neuritis in the extremities and elsewhere did not appear to be influenced. Most of the eighteen new patients described had severe faucial diphtheria with more or less widespread paralysis. Seven died, in each case of heart failure or with evidence of serious myocardial change at necropsy. In some of these fatal cases, however, there

[10] *Ann. intern. Med.*, 1940, **13**, 1744.
[11] *J. exp. Med.*, 1934, **60**, 633.
[12] *J. Path. Bact.*, 1935, **41**, 499.
[13] *Arch. Kinderheilk.*, 1940, **119**, 182.
[14] *Z. Kinderheilk.*, 1940, **61**, 736.

had been evidence of improvement in the diaphragmatic movement before death. Frey's observations on the apparent selective therapeutic action of vitamin B_1 on the nervous system raise points of theoretical interest. The practical outcome of both the papers here referred to is that vitamin B_1 can help in the nervous complications of diphtheria: to what extent requires further observation.

CULTIVATION OF MEDICINAL HERBS

The Ministry of Health has decided to encourage the further production in this country of belladonna, digitalis, henbane, and stramonium. Owing to the closing of some foreign sources of supply, much interest, both professional and amateur, has recently been shown in the growing and collection in this country of all kinds of herbs. Many proposals have been advanced, ranging from suggestions for collecting wild plants by botanists, teachers, school children, etc., to arrangements for extended cultivation by existing firms, private gardeners, and so forth. These proposals and the whole needs of the situation have been discussed at the Ministry with representatives of the various interests and in consultation with the Ministry of Agriculture and Fisheries. In the result, it is felt that extended production on an organized scale may well be limited to the four herbs named above, and that the scheme should be on a commercial basis. The essence of the scheme is that the present commercial firms should extend their cultivation and drying plant. Farmers and owners of large private gardens who would like to cultivate the herbs are recommended to operate in close association with commercial firms to ensure that the crop is properly harvested and dealt with. The Ministry of Agriculture and Fisheries will advise on the problems relating to production and method of cropping. Farmers and private gardeners wishing to grow the herbs are advised to get into touch with the Wholesale Drug Trades Association, 28, Gordon Square, W.C.1.

IS GOATS' MILK SAFE?

In spite of the efforts of the British Goat Society the goat has in the past played but a humble part in the domestic economy of this country. Prejudice dies hard, and the widespread belief that goats' milk necessarily has an unpleasant taste has deterred many people from using it. The goat, however, has many advantages over the cow, particularly in wartime. It is the ideal animal for the small property holder. It is not dependent on imported foodstuffs, as cows are; it can scrape an existence from patches of grass and herbage that are not worth cutting or cultivating; it is inexpensive to maintain; and, properly looked after, it gives a good yield of high-quality milk. In the minds of medical men the idea of the goat is closely linked to that of undulant fever. In Malta, Southern Italy, South-East France, and the Mediterranean littoral generally infection of goats with *Brucella melitensis* is common, and consumption of this milk in the raw state is accompanied by a serious risk of undulant fever. In Great Britain, however, in spite of several direct investigations, neither this organism nor *Br. abortus* has ever yet been isolated from goats. Indeed, up to a few months ago *Br. melitensis* had not been found in any animal in this country, but shortly before he died the late Dr. Menton of Stafford cultivated an unusual organism from cows' milk which turned out on further examination to be identical with *Br. melitensis*. How infection was introduced into the herd was not clear, but the Ministry of Agriculture took rapid steps to control its spread, brought out a special Melitensis Order, and slaughtered the entire herd, as well as numerous sheep and pigs that had been in contact with it. There is therefore every hope that the infection will be stamped out completely. Should it spread to sheep or goats the position would at once become serious, but, as there is no evidence that it has done so, the risk of contracting undulant fever from drinking goats' milk in this country must still be regarded as negligible. It may be pointed out that, unlike cattle, about 40% of which are infected with tuberculosis, the goat is very refractory in nature to this disease. Being free from organisms of both the *Brucella* and the tubercle groups, goats' milk can be recommended without hesitation for human consumption in the raw state.

TUBERCULOSIS IN GENERAL HOSPITALS

It is now widely recognized that pulmonary tuberculosis is an infectious disease. Were the incubation period shorter and less variable, instead of extending as often to years as to months, the path of its spread from one case to another could more often be traced. The contact to which infection must be attributed is usually domestic, and here the danger is accentuated by poor housing conditions and by indefinite prolongation. Another place in which contact may occur is a hospital ward. It is almost inevitable that cases of active pulmonary tuberculosis should sometimes be admitted to general hospitals where no special accommodation exists for them, if only because the disease is sometimes undiagnosed; in some institutions the admission of recognized cases is by no means uncommon. The possible risk to other patients, particularly children, and to nurses is a matter for serious concern. There is good evidence that in certain general hospitals nurses develop tuberculosis more frequently than other women of similar age and antecedents in different occupations. The fact that sanatorium nurses are unaffected is immaterial to this question; there the whole personnel, staff and patients alike, are fully trained in the precautions by which the transmission of infection can be prevented, and open-air conditions are vastly different from those existing in the average general hospital ward. Any compromise in this matter must take into account two quantitative factors. One of these is time—contact for a few days with a single case is quite a different thing from being in a ward where several are habitually under treatment. The second is bacterial output—there is no disease in which this varies within such wide limits, and none in which the quantitative factor is so paramount in determining whether acquired infection shall progress or be arrested even before it becomes recognizable. But whatever policy is adopted for known cases, a more insidious danger remains in the undiagnosed case, often admitted for some other condition. Attention is concentrated on this, and when the condition is surgical a general anaesthetic will often cause a severe exacerbation of the unsuspected lung infection. This patient is dangerous chiefly because none of the precautions are taken which might otherwise reduce the risk of his infecting others. How often such patients find their way into general hospital wards will naturally depend to some extent on the diagnostic ability of those admitting them, but no amount of skill in this direction will exclude them altogether. In the State of Wisconsin in 1933 18% of the deaths from tuberculosis occurred in general hospitals, and in many of these cases the disease was undiagnosed until after admission. In upstate New York during 1936 and 1937 10% of all deaths from tuberculosis took place in general hospitals where there was no special accommodation for such cases; three-

quarters of these deaths were due to pulmonary disease, and of these pulmonary cases 61% were not reported as such until after death. These facts led R. E. Plunkett and E. X. Mikol[1] to undertake a large-scale survey of admissions to a number of hospitals in cities of different sizes in the U.S.A. with the object of ascertaining the number of unrecognized cases of pulmonary tuberculosis admitted. Radiographs of the chest were taken of every patient admitted for whatever condition, except in the case of children under 15, known cases of tuberculosis, and patients too ill to be disturbed. Out of a total of 4,853 radiographs 128 showed evidence of tuberculosis, in fifty-one of which the disease was considered to be clinically significant, and in twenty-seven of these it was clinically unsuspected. The yield of cases which would otherwise probably have been undiagnosed is thus only 0.6%; but if this figure is representative of hospital practice throughout the U.S.A. it means that some 40,000 such cases are admitted to hospitals annually in that country. This is an important and valuable example of the process now known as "case-finding," to which the only serious objection is its expense. The immense resources of the U.S.A. will doubtless enable such investigations to be undertaken on an increasing scale in the apparently healthy as well as in hospital patients. It may be that we in this country shall have to content ourselves for many years to come with more restricted facilities, and clinical acumen will continue to play its part in choosing comparatively few patients for the costly process of *x*-ray and, it may be added, laboratory investigation.

ANTI-TUBERCULOSIS WORK IN INDIA

The first report is now available of the Tuberculosis Association of India, which was established last year at New Delhi under the presidency of the Vicereine (Lady Linlithgow). The Medical Commissioner, Dr. C. Frimodt-Möller, advocates a scheme of control of tuberculosis by organized home treatment as the principal line to follow in the present stage of the campaign. This scheme, which has received the approval of the central committee of the association, is based on the experience gained by the Commissioner during a tour of the various Provinces and States. It will require, he says, a great number of modern tuberculosis clinics, which would have as their object prevention and to a certain extent treatment; a tuberculosis institution with 100 to 200 beds in or near every large city, the beds to be reserved for patients in need of special treatment which cannot be given in their homes or in the clinics; a system of care and after-care committees; and a number of colonies for tuberculous ex-patients who are likely to break down again if exposed to the strain of their old conditions. A vital element in the scheme will be co-operation between the clinics and private practitioners. The clinic doctor is not to be allowed private practice but is to be compensated in that respect. It will probably be according to some such pattern that anti-tuberculosis work in India will develop. Various educational activities have been undertaken by the Association in co-operation with the Red Cross and other bodies. Fifty-five doctors from various Provinces and States have taken postgraduate courses on the preventive aspects of tuberculosis at Calcutta and Madras, and a course for health visitors has been organized at Delhi. The first conference of tuberculosis workers organized by the association was held last November and was attended by over fifty delegates. One result was the setting up of an advisory committee to define the classification of types and stages of pulmonary tuberculosis with a view to ascertaining to what extent the latest developments in the treatment of tuberculosis in the West are applicable to conditions in India. A model clinic is to be constructed at Delhi in the precincts of the Irwin Hospital; it will be under the management of the association, which will contribute Rs. 4,000 a year to its maintenance. The project of converting the Pasteur Institute at Kasauli into a sanatorium of 110 beds (ultimately to be one of 250 beds) is also being considered. The sanatorium, situated where it is, will probably be used chiefly for patients from the north of India, but the training school for doctors in association with it will be an All-India one. Lady Linlithgow at the annual meeting said that she thought it would be claimed that the campaign against tuberculosis in India is well established on a sound basis "with dynamic potentialities of reducing the loss of life and the amount of suffering and misery caused by this disease."

[1] *Amer. Rev. Tuberc.*, 1940, **41**, 381.

SOAP

In a discussion on soap and water as a cause of dermatitis in industry at a symposium on industrial medicine held at the North-Western University Medical School, Chicago, last year, Dr. James Mitchell referred to the specification by the U.S.A. Bureau of Standards that the amount of free alkali in toilet soap should not exceed 0.1%. He pointed out, however, that the much-vaunted "superfatted" soaps were a snare and a delusion; the extra fat, usually spermaceti or lanoline derivatives, merely stuck to the skin and had to be washed off with more soap. It is certainly true that superfatted soaps as sold in this country provide a very unsatisfactory lather. When a profuse, creamy, durable lather is required—for example, for shaving—potash replaces soda in the soap to the extent of 25%. Exactly how soaps exert their detergent and cleansing action appears still to be undetermined. Spring believes that colloidal acid soap, resulting from the hydrolysis of soap with water, unites with the "dirt" to form colloidal adsorption compounds. It is true that some free alkali is necessary for the cleansing properties of soap to become manifest, and it is also true that an excess of free alkali is the chief cause of the dermatitis so common in many occupations concerned with cleaning. A detergent that is used a good deal in American industry contains 80% of carbonate, mostly sodium carbonate; this strongly alkaline substance exerts a macerating action on the skin which is increased by prolonged immersion in water. Dr. Mitchell considered that the alkali in the soap was a more important factor in dermatitis than any allergenic property of the soap. In the discussion that followed his paper Dr. Reeve, director of hygiene in the State of Illinois, said that much benefit had been derived from sodium hexametaphosphate, a solution of which dried on the hands like a film of collodion; the only drawback was that it had to be reapplied three or four times a day. Many people, he said, especially women, developed dermatitis through taking two or three baths a day, thus removing the fatty protection from their skins. American experience of industrial dermatitis from soap appears to be very similar to our own, but one gathers from this discussion that doctors in the U.S.A. are more sanguine about treatment than many British physicians and less inclined to fear relapses.

We regret to announce the death of Dr. Nathan Raw, formerly Lord Chancellor's Visitor in Lunacy, for four years M.P. for the Wavertree Division of Liverpool, and a past-president of the Royal Medico-Psychological Association.

PHYSIOLOGY AND CLINICAL MEDICINE: BRIDGING THE GAP

BY

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Many have been the reports, papers, and letters offered to the medical and academic world, countless the hours and great the discussion expended in endeavours to bridge the gap between the medical sciences and clinical medicine. To intrude upon problems which experienced medical designers have found extremely difficult, and particularly to do so at the height of a threat to the structure of civilization itself, must require a substantial excuse. In self-protection we tender a twofold plea for consideration. First, we do so at the behest of one who has always been in the forefront of educational reform in medicine; secondly, ours, as a new school, has not only the opportunity denied to older institutions, but also the duty of testing out ideas which seem desirable. The time, also, is not as inappropriate as it may at first sight appear. It has been laid down by defence authorities in both Great Britain and the Commonwealth that medical training must continue. It is incumbent upon the university authorities, therefore, to see that the training is carried out as expeditiously, thoroughly, and efficiently as possible. No training programme which is built up of unconnected parts or which permits personal antagonism to influence progress can pretend to any of these desiderata.

The Problem

The first essential to clear discussion is a clear statement of the problem. To us a paraphrase of paragraph 16 of the "Report of the Conference of Representatives" (1935) fills this requirement: "How can the course in physiology be designed to give the student of average ability such knowledge and such education, in so far as the subject is concerned, as will enable him to approach the problems of practice with some degree of confidence and with a legitimate hope that his scientific outlook on health and disease will enable him to learn from subsequent observation and experience?"

The outstanding features of the problem as thus defined are: (*a*) We are concerned with a student of average ability. (*b*) He is to receive both knowledge and education. (*c*) He is to approach his problems, not pick them up unintelligently and sort them as best he may into classically arranged compartments. Three special difficulties affect the solution of this problem. The first of these is the enormous growth in physiological knowledge of recent years. Professors of two generations ago were able to maintain a reasonable acquaintance with most of the branches of their subject; whereas to-day even the full-time research worker is hard put to it to keep abreast of the literature in his own small field. The second great difficulty arises from the first. It is that of maintaining contact between the various branches of physiological knowledge and inquiry. Such maintenance of contact is essential if a balanced educational dietary is to be provided for the student of average digestive abilities. This difficulty of maintaining balance is in some respects made greater by the third, that of the special demands of medical studentship. That there are special demands cannot be gainsaid, and indeed they find expression in the definition of the problem enunciated above. It is the weight of concession to be given to these three difficulties that has conduced to much of the verbal exchange and difficulty of fulfilment.

Proposed Solutions

Suggestions for meeting these difficulties put forward by the representatives of the Universities of Oxford, Cambridge, and London, the Colleges of Physicians and Surgeons, and the Society of Apothecaries included the following: (*a*) the stressing of the physiology of man; (*b*) the co-operation of the clinical staff; (*c*) the demonstration of deranged functions in clinical cases; (*d*) the basing of examinations on the student's grasp of function rather than memorization of detail.

The interim report of the Curriculum Committee of the General Medical Council suggested that too much attention was given in some schools to branches of physiology of little vocational value, and that physiology and clinical medicine should be brought into closer relation both by the continuation of instruction in applied physiology into the clinical years and by the association of clinicians with the teaching of physiology. These suggestions were incorporated in the resolutions adopted by the General Medical Council on May 29, 1936, and put into operation as from November, 1938.

The need for correlation of clinical problems with physiological teaching finds ample confirmation in the publication and widespread use of such textbooks as Wiggers's *Physiology in Health and Disease*, Samson Wright's *Applied Physiology*, and Best and Taylor's *Physiological Basis of Medical Practice*, which make a substantial contribution to the solution of the problem.

To the many addresses dealing with this subject we shall make no detailed reference. Each endeavours to recondition some essential part of the general structure of medical education, and all should be studied by medical administrators.

The Position in Queensland

The Faculty of Medicine in the University of Queensland was founded in 1936 by the establishment of Departments of Anatomy and Physiology. Departments of Pathology, Medicine, Surgery, Obstetrics, Social and Tropical Medicine, and Medical Psychology followed. The curriculum as a whole is described elsewhere (*Medical Journal of Australia*). It is sufficient here to point out three matters of considerable influence upon the design of the syllabus for physiology.

The most significant matter is the newness of the school. We do not know how long it is since a new medical school was established in the British Empire, but it is over fifty years since the last one was established in Australia. Not only is it newborn, but its birth was preceded by intense criticism of medical teaching from within as well as without. Of it, as of modern children in general, its parents are able to say, "You have opportunities unheard of in my day." With increased opportunities, however, go increased responsibilities. It is incumbent upon the school to give the best possible expression to the desires and to heed the admonitions of its elders.

On the other hand, this school was founded upon a definite understanding that due weight in teaching and due attention in research would be given to the problem of tropical settlement by white races. In the eyes of some, such directions will undoubtedly appear parochial and restrictive of scientific freedom. To others a definite objective such as that laid down will appear a very much better reason for the establishment of a faculty than the desire to create yet another factory for the mass production of medical practitioners. Whatever the individual opinion, however, the terms are clear and must be given due consideration in the design of any syllabus.

The third matter evolves to a certain extent from the second. The Physiology Department, while founded in the Faculty of Medicine, has to provide adequate teaching not only for medical students but also for students in the Faculties of Dentistry, Science, and Veterinary Science. Their needs are not merely adventitious: their services form an integral part of the wider problem of tropical settlement. But staff, funds, and time have material

limits, so that as much of the instruction must be given on a conjoint basis as is consistent with efficiency.

The Solution adopted in Queensland

The complete course in physiology for medical students extends over two years, each of three terms. Biochemistry is given by a separate lecturer, but under the control of the professor of physiology, and is closely integrated with the physiological side of the course. The whole course is planned on a progressive basis, the student passing successively from the familiar to the unfamiliar, and developing his knowledge in integrative fashion.

The First Year

In the first year the instruction is biased towards the theoretical, basic data are acquired, and learning discipline is instilled. The practical work of this year does not begin until the second term, except in biochemistry, and remains behind the didactic teaching. There is a deliberate attempt here to save the younger student from himself by forcing the pace, to cover the greater part of the memory work, and to reveal the weaker student before he is irrevocably committed to the course.

The first twenty lectures in physiology deal with the physiology of tissues. The student has done biology, chemistry (including some organic and physical chemistry), and physics. He knows the different kinds of tissues in an elementary fashion, and he is undergoing at the same time an intensive course in histology. It is explained to him that this section of the work deals with the fundamental physiological units, the building bricks, from which he will learn to build up the entire organism as a working machine. The syllabus includes:

> Properties of nervous tissue, muscle tissue, the nerve–muscle unit, endothelium, reticulo-endothelium, haematopoietic tissue, connective and skeletal tissues, and the cell membrane, and the physiological aspects of differentiation and growth.

The second twenty lectures in physiology deal with the physiology of organs. The fundamental units with which the student is now familiar are studied, combined in the different patterns which make up organs, much as building bricks of different kinds go to make up walls, floors, and ceilings. There is of necessity some repetition of what has gone before and some anticipation of what is to come, but this is part of the synthetic process which runs throughout the teaching. This portion of the syllabus includes:

> The general physiology of organs of general sensation, special sensation, conation, absorption, transference, storage, secretion, excretion, integration, defence, and reproduction.

While this instruction in physiology has been progressing lectures in fundamental biochemistry have been developing from the point at which the organic and physical chemistry of the previous year ceased. The syllabus here includes:

> Elements occurring in the body, the chemistry of carbohydrates and lipoids, hydrogen-ion concentration, buffers, the properties of colloids, the chemistry of proteins and salts, the action of enzymes, and the properties of vitamins.

In addition, a course of ten lectures in the principles of scientific method is given by arrangement with the Department of Philosophy.

During this period the student has been led progressively to conduct from fields previously familiar a brief but comprehensive survey of fundamental physiology. He is now acquainted with living matter, not as a static structural entity, but as an ever-changing, adaptable, purposive being. Nothing in his subsequent learning should surprise him; rather should it appeal to him as the logical development of what he has already witnessed, moulded by opportunity and selection to the service of evolution. To him the intricacies of the circulatory system should not be something that is, but something that had to be; something that has evolved as offering most to the varying demands of the entire organism.

The student is now fit to take up the study of systematic physiology. Moreover, he is in a position to cover the ground rapidly. In sharp contradistinction to the previous sections, his textbooks are quite adequate, so that lectures cease to be didactic, becoming instead guides and tutorials. In the second half of his first year he is led relentlessly through the systems—the classical physiology. This demands much labour from the student; but the demand is deliberate, and follows the initial period of training. The weaker members who did not or could not profit by that training now reveal themselves, and by examination may be saved unnecessary pain and expense of continuance. Biochemical instruction during this period co-operates by covering the ground of chemical metabolism—carbohydrates, fat, protein, nucleo-protein, and mineral.

Practical work in biochemistry continues at an even pace throughout the year in parallel with the lectures. There is no practical work in physiology in the first term. In the second term it deals with the behaviour of tissues and organs, while in the third term the behaviour of certain systems is studied. The syllabus is as follows:

> Second term: properties of nerve and muscle as shown by the nerve–muscle preparation; haematology, normal and reactive; properties of cell membranes; dissection of the eye; examination of special tissue functions; examination of general sensation.
>
> Third term: cardiac action; haemodynamics; haemic respiratory function; pulmonary respiration.

The Second Year

The second year, in contradistinction to the first, is predominantly practical in character. The knowledge already gained is correlated and applied to the future problems of medicine, and the student is given increasing opportunities of unravelling problems for himself in his individual style. The aim is to finish the year with students who are thoroughly familiar with the human body as a working machine, who possess a common-sense appreciation of what might go wrong, who are fit and keen to learn the art of medicine as well as study the detailed manifestations of disease.

In the first term twenty lectures on integration and adaptation teach the students first to study the manner in which the various systems are integrated into a single reactant organism, and then to examine the way in which this intact organism adapts itself to changes in the environment. The syllabus reads as follows:

> Integration: nervous co-ordination at different levels; the tonic and balanced states; chemical integration; interaction of endocrines; interrelation of nervous and chemical mechanisms.
>
> Adaptation: adaptation of whole organism to exercise, heat, altitude, haemorrhage, acid-base disturbances, infection.

This is followed in the second term by a further series of twenty lectures on clinical applications. This course marks the culmination of the didactic teaching of the physiological section. The plan of the lecture is of some importance. The typical lecture is divided into three parts. In the first the mechanism of some important bodily function is outlined; in the second, consideration is given upon an *a priori* basis to the ways in which this mechanism might become disturbed; while the third is devoted to a brief survey of the more important clinical events in which such disturbances occur. The lecture course for the current year includes the following:

> Disorders of sensation, vision, effector mechanism, cardiac rhythm and rate, cardiac mechanism, haematopoiesis, peripheral vessels, respiration, gastric function, intestinal function, carbohydrate metabolism, fat and protein metabolism, endocrine balance, energy metabolism, renal function, tissue hydration.

While these are proceeding the lecture course in biochemistry is dealing with blood, urine, milk, special organs, tissue respiration, and the embryo. The clinical applications of biochemistry are not covered until the third term. These last lectures are more pragmatic in design, dealing

directly with the use of gastric test meals, urine analysis, renal function tests, glucose-tolerance tests, examination of the cerebrospinal fluid, and kindred methods of biochemical investigation.

The practical work of the year is carried out entirely on the group system. In the physiological section it starts with "round games," the class being divided into groups of four, each group conducting a different experiment and moving on to the next experiment on the succeeding day. In this way the study of the systems begun the preceding year is completed, while at the same time individual talent and initiative can be drawn out. This objective is carried a stage further in the second term, when teams investigate the integrative and adaptative reactions of their own bodies. One member becomes the subject, while each of the others has a specific duty. Thus in exercise experiments, for example, one records the pulse rate, one the blood pressure, one the respiratory volume and rate, and two measure the metabolic rate, while others analyse the venous blood for gaseous and other changes. The subject afterwards correlates the findings.

In the second term, also, the practical demonstration of the clinical applications begins. Once a week the class meets in the hospital lecture theatre. A selected patient is brought in. The professor of physiology gives the class such information as he thinks necessary, and then proceeds by individual questioning and examination of the patient to draw the class on to a consideration of the physiological mechanisms and their disorders which might explain the facts before it. In this work it is essential to keep certain principles clearly in mind. In the first place, it is the physiological mechanism and not the disease which is being demonstrated. Secondly, it is the class which must make the decisions in so far as its knowledge, the unaided senses, and common sense can lead it. It is fatally easy for the demonstrator to accept the initiative from the class and to branch off into discussions of purely clinical matters instead of illustrating the importance of physiological knowledge and physiological modes of thought in the approach to clinical problems. The following conditions were demonstrated last year:

> Dyspnoea of haemic origin, dyspnoea of respiratory origin, referred cardiac pain, upper motor neurone paralysis, lower motor neurone paralysis, weakness of diabetic origin, obstructive oedema, cardiac oedema, renal oedema, Parkinsonism, hyperpiesis, vasospastic headache, obstructive jaundice, hyperaesthesia, cyanosis, Addison's disease, diabetic ischaemia, diabetic coma, hypoglycaemia.

In the third term this practical study of clinical applications is intensified. The class is divided into groups of four. The weekly session begins with the professor dictating notes to each group on the main features of the patient allotted to it. The group is given half an hour in which to question the patient and make any reasonable examination with a view to detecting any disturbances of his physiology which may be present. At the end of that time the group is given the case-history sheets and told to rectify omissions and discuss the mechanism at work. After a further half-hour's study the professor conducts a cross-examination of the group members on their observations, deductions, and knowledge. The principles enunciated for the preceding class-teaching must again be kept clearly in mind. It is the mechanism, not the disease, which is important, and the student must follow it for himself. To cross-examine twelve groups of students, each on a different patient, is not an easy morning's work, but his cross-examination is the most valuable part of the session. It must, moreover, be undertaken by someone in authority, whose good opinion it might be advisable to secure—at least for the remaining few weeks of the year. Indeed, the students find it good revision and also good practice for the forthcoming viva voce examinations.

Practical biochemistry continues its even tenor during the second year, following similar lines of development as regards individuality and clinical application. In the first term analysis of blood and urine is systematically and thoroughly covered. In the second term individual projects are allotted to groups, to encourage resourcefulness and to inculcate some idea of biochemical investigation. Among the projects issued in 1939 were:

> Preparation of crystalline pepsin, extraction of hepatoflavine, preparation of haemoglobin and its crystalline derivatives, preparation of hypoxanthine and its oxidase, determination of hexose monophosphate in muscle, investigation of ascorbic acid in vegetables, preparation and assay of adrenaline, preparation and assay of secretin.

At the end of the term one member of each group presents its experience—not always successful—to the class in the form of a seminar.

In the third term practical biochemical investigations of bodily function are conducted by the whole class on each other or on material obtained from hospital. While in general these run parallel with the lectures, the availability of material at times determines the order.

It is the general practice in Australian universities to hold examinations at the end of each academic year. Permission to proceed to the studies of the next year is conditional upon passing these examinations. Under certain conditions Supplementary Examinations are granted towards the end of the long vacation. This system is followed in Queensland. It has the advantages of strengthening discipline and of weeding out the weak students at an earlier stage. The degree examinations are not exclusive, as questions may quite well be set in the third degree examination bearing on second-year work, while in the Final Examination anything relevant to clinical knowledge may be introduced. In the first examination in physiology evidence of learning and a certain amount of detail are required; in the second examination in physiology understanding rather than mere feats of memory is sought.

Clinical Years

We have been at pains to describe the way in which links have been extended from physiology forward to clinical medicine and surgery. The interrelationship has also been strengthened by the reverse process of reference to physiology in the course of clinical instruction. The teaching staff of the later years is continually active in encouraging students to build their art and detailed knowledge of medical practice on the firm foundation of anatomical and physiological understanding. Interdepartmental consultation is of frequent occurrence on controversial matters, and many clinical teachers have taken the opportunity of postgraduate classes to reinforce their physiological knowledge. Doubtless the converse process will soon be possible.

A feature to be taken up this year is the weekly holding of a combined clinical discussion in which all departments will share. While this is primarily designed for the benefit of final-year students the results will have a wider effect upon the co-ordination of teaching.

Difficulties to be Overcome

The volume of discussion that has surrounded this subject affords some indication of the difficulty of its solution. To a certain extent we were, in Queensland, freed from difficulties attendant upon local tradition, but others remained. It may be instructive to conclude with remarks thereon.

The first difficulty was that of obtaining sufficient qualified assistance. There were no local medical graduates, while those from southern universities found employment near their alma mater or came northwards for clinical experience. There were no science graduates with a training in physiology. The staff had to shoulder the whole responsibility for teaching, even to teaching laboratory attendants the rudiments of their craft. Luckily, this was essentially a problem of time. We were fortunate in our technical staff, who quickly absorbed the new knowledge and are now invaluable; we have three years of science graduates trained at least in biochemistry (three students with honours); while before long we shall have

our own graduates as resident medical officers in the hospital. The appointment of a medical man (F. J. Booth) as the first lecturer in physiology afforded great assistance to the clinical side.

The second difficulty was that of introducing the idea of bedside physiology to a medical world not in immediate contact with recent educational developments. Fortunately, we quickly gained some influential adherents from the ranks of the profession who maintained our courage until the others had an opportunity of studying the scheme in operation and of becoming converted to the faith. It soon became evident that the physiology of to-day had very much more to offer the practitioner of medicine than might have been expected from older teaching.

A third difficulty, universally to be found, is the volume of routine administrative work encountered. This appears to be inseparable from the conduct of an active and growing department. Organization and discrimination can afford some protection, but responsibility demands a certain degree of personal attention. The employment of special administrators mainly changes old problems for new and at increased cost. These duties remain the chief handicap to teaching and research efficiency.

The problem of the balance between teaching and research has engaged us, as it has everyone else. Our policy has been clear: teaching is the first duty of the school, and its demands must preferentially receive reasonable satisfaction; but every teacher must be granted opportunity to carry out investigational work, and future research workers must be encouraged and trained in general principles. This of course restricts the rate of teaching development, but only in details. It is, moreover, deliberately done in holding a balance between these functions.

The special requirements of tropical settlement are met by the introduction of lectures on the heat-regulating mechanism and adaptation to diminished heat loss, and also by the conduct of practical classes on kindred matters in which the student makes himself familiar with methods of atmospheric and climatic assessment and the reactions of his own body to hot climates provided in the department's air-conditioning room. The main difficulty in this section is the preservation of a just balance with the remainder of the course, as this subject happens to be the main research interest of the professor.

The needs of non-medical students have been met in most cases by introduction of the "tree" system. During the first three terms students of the Faculties of Science and Veterinary Science attend the same classes as the medical students. During the fourth term veterinary science students branch off on to special courses for most of their work, science students for some of it. In the fifth term the dissociation from medicine becomes complete, but some association between science and veterinary science is maintained to the end. In the case of dentistry and physiotherapy it has been found necessary to provide conjoint classes separate from those of the other students.

Conclusion

In these pages we have outlined an attempt made by a newly established department in the youngest Dominion to give practical expression to ideals which have for some time appealed to the teachers of the motherland. The opportunity has been taken not only of establishing the closest links between the teaching of physiology and the problems of medical practice, but also of establishing from the very beginning of the subject a policy of progressive and co-ordinated transition. The incoming student, armed with a knowledge of fundamental physical, chemical, and biological conceptions, is first led to apply these to cellular behaviour. He then proceeds to study groups of cells working together as organs, organs co-ordinated as systems, systems integrated into an intact organism. Finally, he discovers how this integrated being reacts to the vicissitudes of normal and abnormal environments. The teachers have now done their best: it remains with the student to succeed where Pygmalion failed.

Nova et Vetera

CREATIVE CENTENARIANS

In the course of an article on the two French historians of chemistry, Chevreul and Hoefer—one of the fourteen articles in the special number[1] of the *Bulletin of the History of Medicine*, brought out by Professor H. E. Sigerist to celebrate the seventieth birthday on March 17 of Arnold C. Klebs, the authority on *incunabula*—there is an attractive excursus on "creative centenarians." It is estimated that centenarians occur in the proportion of 1 in 100,000 lives, and G. Sarton[2] of Cambridge, Mass., the author of this article, rather unkindly suggests that they nearly all are so mediocre as to suggest that they are examples of survival of the unfittest. His account of the exceptions to any such rule is therefore all too short. It includes Eugène Chevreul (1786–1889), who in his one hundred and second year was president of the Société d'Agriculture and contributed a paper to the Académie des Sciences, of which he was a member for sixty-three years, on the part played by nitrogen in the vegetable economy. A prolific writer and much in evidence at scientific meetings, his privilege in this respect raised a protest on one occasion, when the perpetual secretary gave as the justification "it suffices to be a hundred years old." When about 85 years of age he described himself on the title-pages of his publications by the words "doyen des étudiants de France," instead of the usual academic distinctions. The only other man of science to complete his century mentioned is the Spaniard Manuel Garcia (1805–1906), the musician and inventor of the laryngoscope. Fontenelle (1657–1757), the French philosopher, poet, and miscellaneous writer, missed his century by thirty-two days. To these may be added Sir Henry Pitman (1808–1908), registrar of the Royal College of Physicians of London, who just completed his 100 years, and Martin Routh (1755–1854), bibliophile and president for sixty-three years of Magdalen College, Oxford, who died in his hundredth year.

In answer to the question "How did you manage it?" centenarians have given contradictory answers; but it may be generally agreed that a family history of longevity supplemented by all-round temperance and equanimity are the most effective passports. Chevreul conformed by having parents both nonagenarians, and though in his long life he saw in his native land (which he never left for a day) four kings, two emperors, three republics, and four revolutions, from 1870 he never opened a newspaper. Fontenelle and Garcia were also careful to avoid wearisome worries.

HIPPOLYTE CLOQUET (1787-1840)

This year marks the centenary of the death of Hippolyte Cloquet, the distinguished French anatomist and pioneer in rhinology. He was born on May 17, 1787, in Paris, where he received his medical education and graduated in 1815 with a thesis entitled "Dissertation sur les odeurs, sur le sens et les organes de l'olfaction." His principal works are as follows: *Traité d'anatomie descriptive* (1816), which went through six editions and was translated into English by Robert Knox, the Scottish anatomist and employer of the resurrectionists Burke and Hare; *Osphrésiologie, ou traité des odeurs, des sens et des organes de l'olfaction, avec l'histoire des maladies du nez et des fosses nasales et des opérations qui leur conviennent* (1821); *Faune des médecins, ou histoire des animaux et de leurs produits* (1822–7); and *Traité complet de l'anatomie de l'homme* (1825). He also continued the *Système anatomique* begun by Vicq d'Azyr (1792–1838), was co-editor of the "Dictionnaires de médecin, chirurgie et pharmacie" for 1821, and translator of Robert Thomas's *Modern Practice of Physic* (1818) and of Castannell's *Elementa di farmacia* (1820). His younger brother, Jules Germain, and his eldest son, Louis André Ernest, were also eminent anatomists. He died on March 3, 1840.

[1] *Bull. Hist. Med.*, 1940, **8**, 317.
[2] Sarton, G.: Ibid., 419.

THE CLEARANCE OF AIR RAID CASUALTIES FROM AID POSTS

BY

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AND

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"Clear! Clear! Clear!" has always been the clarion cry for the disposal of casualties from the front line. All parts of Great Britain now constitute a front line, and casualties, particularly from air raids, are occurring and may become very numerous, so prompt clearance is most desirable. Up to now no definite official ruling as to the clearance of casualties from the many aid posts has been made, although the medical officers concerned have sought it not infrequently. It is hoped that this brief survey of the question may be of help and bring about some accepted scheme.

Before actual clearance one point of the greatest importance arises. It is that every casualty must have a casualty label or card (M.P.C. 46) properly filled up and securely attached to the person, and sent with him or her to the place of clearance after due registration at the post. In this war all casualties, whether military or civilian, will be dealt with in relation to a pension by the Ministry of Pensions; hence the necessity for accurate registration. It is also desirable to recognize that not all casualties from air raids are "wounded" persons, and that the "unwounded" will have to be dealt with in the same manner as the "wounded" so far as clearance is concerned. One last point is that clearance (except in the case of those who must be rushed to the casualty hospital) should not take place until the "all clear" has been given at the end of the raid. This may mean even some hours of waiting in the rest-room of the aid post.

There are at least six possible places to which casualties may be cleared from any aid post in a populous area. They are: (*a*) home; (*b*) the casualty hospital; (*c*) the advance base hospital; (*d*) the base hospital; (*e*) special hospitals; (*f*) the mortuary.

A. Clearance to Home

Probably at least one-third of the casualties received into an aid post—which post should act as a "buffer" between the street or building and the casualty hospital—may safely be sent home to be under the care of their own doctor after suitable treatment at the aid post. The following may be given as a few examples of such cases:

Unwounded.—The badly frightened, the definitely hysterical, the slightly shocked, and cases with antecedent disease, such as chronic cardiac lesions.

Wounded.—The small superficial wounds, particularly those requiring few, if any, sutures.

A caution should be given here, for a small punctured wound may be in reality a dangerous wound on account of possible injury to deep structures.

Transport.—Not all cases going home require wheeled transport, but those which do can be accommodated by the "auxiliary" ambulance service in a large town.

B. Clearance to the Casualty Hospital

The casualty hospital will be situated comparatively near the aid post in any town. It is the hospital ready and prepared to deal with cases requiring immediate operation, mostly with open wounds, but some not. It is largely due to the fact that early excision and possible suture of wounds tends to prevent or minimize infection that so large a number of beds are ready to receive such casualties, but it is even more because of the time factor, so that reception at a casualty hospital may be prompt. Examples of the types of wounded and unwounded casualties which must be sent, and that quickly, to casualty hospital are found among the following:

All open fractures, particularly those associated with lacerated wounds. Through-and-through flesh wounds, and especially those associated with injury to important structures. Penetrating wounds of the abdomen or thorax. Such conditions as internal haemorrhage from injury to the liver or the spleen, even if there is no actual wound. Every case of cerebral compression, even if not associated with a wound.

Transport.—All these cases are very urgent and are stretcher cases requiring careful transport by ambulance. The prompt arrival of such vehicles after being summoned is of the utmost importance.

C. Clearance to the Advance Base Hospital

This hospital is likely to be situated some distance from an aid post—often as much as twenty miles. The purpose of this hospital is to receive cases which do not require immediate operation but are likely to have to be retained for at least a week before being fit to return home. Among cases in this category are:

Closed fractures of the patella, which may need suture after a few days. Closed fractures of the ribs, with evidence of injury to the lung. Cases of more than slight concussion.

Transport.—All these cases will require transport by ambulance, but some may go as "sitting" cases.

D. Clearance to the Base Hospital

In some instances the base hospital is a long distance from the aid post—as much as fifty miles. In it will be found a number of beds ready to receive casualties from all the other three receiving stations. There are not many casualties which will be thought to be suitable to be sent from an aid post to the base hospital direct, but some of these will be: closed fractures of the bones of the lower limb and the severe cases of concussion.

Transport.—All cases going to the base hospital require either road or rail transport.

E. Clearance to Special Hospitals

Near large centres of population there will be found hospitals reserved for the reception of certain types of casualties. It is possible that some of these casualties can and should be sent direct from the aid post to the special hospital. Among these are:

Recent parturition and threatened abortion cases—to maternity hospital. Certain ophthalmic lesions—to an ophthalmic hospital. Maxillo-facial cases—to a "jaw" centre. Definitely mental cases—to a mental hospital.

Transport.—All such cases will need transport by ambulance and in the charge usually of a skilled attendant.

While it is probably true that most of the casualties sent to other than the casualty hospital will have to go by the devious way of the evacuation department of the casualty hospital, yet it may be that, at one given time, at the "all clear," there may be a full ambulance load of cases suitable for the advance base hospital. Probably for all concerned, and in particular in the interest of the patient himself, these should be sent direct, to save time and inconvenience.

F. Clearance to the Mortuary

Casualties may be dead on arrival at the aid post, and others may die after admission there. All dead bodies must as quickly as possible be removed from the presence of the living and often shocked casualties, but it is most

important that identification should be carried out, if possible, before the corpse is taken from the aid post.

Transport.—There are special means for the removal of bodies to a mortuary, and these should be known and used promptly.

Abridged Table of Casualties admitted to Aid Posts, with the Appropriate Clearance

Abbreviations: H.=Home. C.H.=Casualty Hospital. A.B.H.=Advance Base Hospital. B.H=Base Hospital. S.H.=Special Hospital.

(1) *Wounds*

Incised :
Minor—H.
Major—C.H.
Punctured :
Small in limbs—H.
Deep in limbs—C.H.
Thoracic—C.H.
Abdominal—C.H.
Lacerated :
Small—H.
Large—C.H.
"Through-and-through"—C.H.
Ophthalmic—S.H. (Ophthalmic)
Scalp :
Without complications—H.
With complications—C.H.
Wounds with retained foreign bodies :
Small—A.B.H.
Large—C.H.

(2) *Contusions*

Slight—H.
Severe—A.B.H.

(3) *Fractures in Upper Limb*

Clavicle, closed—H.
,, open—A.B.H.
Scapula, closed—H.
,, open—A.B.H.
Humerus, closed—A.B.H.
,, open—C.H.
Elbow Region :
Closed—A.B.H.
Open—C.H.
Radius and/or Ulna :
Closed—H.
Open—C.H.
Wrist Region :
Closed—H.
Open—C.H.
Carpus, closed—H.
,, open—C.H.
Metacarpus and Phalanges :
Closed—H.
Open—C.H.

(4) *Fractures in Lower Limb*

Femur, closed—B.H.
,, open—C.H.
Knee Region :
Closed—B.H.
Open—C.H.
Patella, closed—A.B.H.
,, open—C.H.
Fibula only :
Closed—H.
Open—A.B.H.
Tibia and Fibula :
Closed—B.H.
Open—C.H.
Ankle Region with displacement :
Closed—B.H.
Open—C.H.
Malleolus, Either :
Closed—H.
Open—A.B.H.
Tarsus, closed—B.H.
,, open—C.H.
Metatarsus and Phalanges :
Closed—H.
Open—A.B.H.

(5) *Fractures, Thoracic*

Ribs, closed :
No complications—H.
With complications—C.H.
Ribs, open—C.H.
Sternum, closed—A.B.H.
,, open—C.H.

(6) *Fractures, Pelvic*

Closed—B.H.
Open or with complications—C.H.

(7) *Fractures, Spine*

Closed and Minor—A.B.H.
Closed and Major—A.B.H.
All open—C.H.

(8) *Fractures, Skull*

Vault, closed—B.H.
,, open—C.H.
,, depressed—C.H.
Base—C.H.

(9) *Fractures—Facial Bones*

Nasal—H.
Malar—H.
Maxillae—S.H. (Maxillo-facial)
Mandible :
Closed of ramus—H.
Open of body—S.H. (Maxillo-facial)

(10) *Dislocations in Upper Limb*

Clavicle, inner end:
Forwards—H.
Backwards—C.H.
Outer end—H.
Humerus—H.
If complicated—A.B.H.
Elbow, both bones :
Closed—H.
Open—C.H.
Radius, head—H.
Carpus, closed—H.
,, open—C.H.
Metacarpus, closed—H.
,, open—C.H.
Phalanges, closed—H.
,, open—H.

(11) *Dislocations in Lower Limb*

Hip—A.B.H.
Patella, closed—A.B.H.
,, open—C.H.
Knee—A.B.H.
Ankle (see Fractures)
Tarsus, closed—A.B.H.
,, open—C.H.
Metatarsus, closed—H.
,, open—C.H.
Phalanges, closed—H.
,, open—H.

(12) *Dislocations*

Mandible—H.
Rib Cartilage—H.
Knee Cartilage—H.

(13) *Sprains and "Sprain" Fractures*—H.

(14) *Haemorrhage*

Arterial :
From small wounds—H.
From medium-sized wounds, artery ligatured—H.
From large wounds—C.H.
From punctured wounds—C.H.
Into body cavities—C.H.
Capillary—H.
Venous :
Slight—H.
From varicose veins—A.B.H.

(15) *Burns and Scalds*

First degree—H.
Second degree :
Little shock—H.
Much shock—C.H.
Third degree :
Small area—A.B.H.
Large area—C.H.
Other degrees—C.H.

(16) *Nervous Conditions*

Badly frightened—H.
"Hysterical"—H.
"Fainting"—H.
Definitely mental—S.H. (Mental)
Unconscious :
Easily roused—H.
All other types—C.H.

N.B.—In case of any doubt send casualties to the Casualty Hospital.

(17) *Abortion, Miscarriage, In labour, Recent delivery*—S.H. (Maternity)

(18) *All Dead Bodies*—Mortuary

D. Morel-Fatio (*Thèse de Paris*, 1940, No. 332), who records six cases, four of which were in slaughtermen and two in butchers aged from 26 to 50, states that the external tuberculous inoculation, as it affects persons whose occupation brings them in contact with cattle, occurs almost always under the same conditions. About 15% of slaughtered animals present some pulmonary lesions, so that slaughterers are daily exposed to massive infection. When the bovine bacillus is introduced subcutaneously the disease may affect the joints and synovial sheaths or remain localized in the subcutaneous tissues. In some cases it is not possible to check the diffusion of tubercle bacilli throughout the system, and death may result.

RESTRICTIONS ON HIGH-FREQUENCY APPARATUS

The following notice concerning the restrictions now placed by the Defence Regulations on the use and possession of high-frequency apparatus has been issued for publication by the Home Office.

The Home Secretary has made an Order under Regulation 4C of the Defence Regulations forbidding any person in the United Kingdom to use or possess high-frequency apparatus having a high-frequency output of over 10 watts except under permit from the Postmaster-General. Such permits may be issued only to hospitals, clinics, or other institutions providing medical or surgical treatment which are provided by a local authority or supported wholly or partly out of any public funds or by a charity or by voluntary subscriptions; to manufacturers who require to use high-frequency apparatus; to makers of and dealers in such apparatus; and to persons in charge of laboratories used for purposes of research or instruction.

The principal types of apparatus to which the Order applies are: (1) diathermy and electro-medical apparatus using valves or spark coils: such apparatus is frequently known as ultra-short wave (or short or long wave) diathermy, surgical diathermy, or therapy apparatus; (2) high-frequency furnaces; (3) eddy current heating apparatus such as is used by valve and electric lamp manufacturers; (4) testing oscillators with a high-frequency output exceeding 10 watts. It does not apply to the normal type of violet-ray equipment, to *x*-ray apparatus, infra-red and ultra-violet ray apparatus, medical shocking coils, or to wave meters and low-powered testing oscillators as used by radio dealers.

Careful measurements have been taken of the electric field radiated by apparatus of the type covered by the Order, especially electro-medical apparatus. High-frequency apparatus emits radiations covering an extremely large band of wave-lengths, and these radiations cannot be confined to any one wave-length. It has been proved that interference to wireless sets on the ground can be experienced at distances exceeding ten miles, while interference to wireless sets in aircraft flying at 10,000 feet can be experienced at fifty miles or more. The danger of interference at a vital moment to the wireless communications of the Services and to the radio control of our own aircraft is so great that it has been found necessary to issue this prohibition. It should be realized that the operator of this type of apparatus is nearly always unaware of the interference it is causing, and it is most difficult for the Service being interfered with to locate the source of interference.

The Order applies to the whole of the United Kingdom and came into force on September 2, and all private individuals and private nursing homes now using electro-medical or other apparatus of the types to which the Order applies must forthwith take all steps to ensure that no further use is made of it by any person. They must also, if they have not already done so, report their possession of the apparatus to the local police, as required by Regulation 7A of the Defence Regulations. The Order provides that persons are to surrender the apparatus on demand to officers of the Post Office for custody. The Post Office engineers will communicate as soon as possible with all private persons and nursing homes who have reported possession of the apparatus, with a view to taking it into storage. Apparatus not reported to the police is liable to be seized.

Public and voluntary hospitals, clinics, and institutions, and manufacturers who use high-frequency apparatus of the types affected by the Order for industrial purposes must apply at once for a permit to the Engineer-in-Chief, Radio Branch, General Post Office, Harrogate, Yorks, giving their full name and address and particulars of the apparatus and the purpose for which it is used. They may, however, continue to use their apparatus pending receipt of a reply. If their application is approved they will be granted a temporary permit, to be followed later by the grant of a permanent permit, which will normally be subject, *inter alia*, to the following conditions: (*a*) that the apparatus shall be used only at one address, which will be specified in the permit; (*b*) that the room in which the apparatus is installed has been electric-

ally screened in accordance with specifications laid down by the Post Office.

It is recognized that the severe restrictions now imposed must cause inconvenience, and in some cases hardship, but it is hoped that all concerned will bear the restrictions as cheerfully as possible in the knowledge that they are imposed solely in the interests of the security of the nation.

*** The Secretary of the British Medical Association states: "When this Order was published the Association immediately discussed the matter with the authorities concerned on behalf of the many practitioners whose work will be seriously affected. Unfortunately the Order is necessary in the interests of national security and cannot be modified in any way."

VENTILATION IN THE BLACK-OUT

With lengthening darkness the problem of black-out becomes more oppressive to every citizen. The black-out takes its toll of life and limb in the streets, but indoors it also makes heavy exactions upon health and spirits. The country may not repeat its good fortune of relative freedom from epidemics in the second winter of war, and if it does not, the conditions behind the closed windows, with living rooms more crowded and workrooms in longer occupation than ever before, black-out may well be a large contributory cause.

Health of Factory Workers

Many of the modern factories, especially where there is a works medical officer, have made their air raid precautions with due regard to the health and eyesight of the workers; but the vast majority of workers in this country are still employed in small industrial units, in very many of which improvised lighting arrangements have been made solely with a view to satisfying the police that no light is visible outside the building. Even where there is little or no night work some part of the black-out arrangement, such as a window surround, is allowed to remain in position in the daytime, and very largely nullifies ventilation, which might otherwise be adequate. Most factories and workplaces—after calling in skilled advice if necessary—can be blacked out effectively while at the same time ventilation is ensured. Where this has not been done it should be put in hand at once before the days of darkness are upon us. It is at least as important to protect the worker against probable ill-health as it is to protect him against possible air-raid injury.

Travelling in Sealed Vehicles

Frequently the exhaustion of the day's work is added to by the strain of the groping journey home under black-out conditions. On suburban trains the conditions as to ventilation are often extremely unsatisfactory, while the modified lighting does no more than make the darkness visible. On longer railway journeys good lighting is provided, but at the cost of sealing up all apertures, so that the overcrowded railway carriage is a place of acute discomfort. Sir Malcolm Watson relates that during his recent journey to India at a certain point on the voyage the ship was blacked out, and immediately an epidemic of influenza occurred, though fortunately not of a severe type. Whoever drew up the regulations for the blacking-out of the ship had not realized that it was possible to prevent egress of light without seriously interfering with the ventilation. The attention of the commander was drawn to this fact, and improvements were made. The same thing could be done on all public vehicles, although on those used for short journeys no elaborate provision may be judged necessary. In the home, again, the black-out is likely to be amateurish, though the family are occupying the airless rooms to an extent they have never occupied them before. This means more physical exhaustion and the maximum of domestic irritation.

Light Traps and Other Devices

If the problem of improving ventilation under conditions of restricted lighting has not been solved it is not for want of suggestions of various expedients. Some of these were mentioned in an article published in this *Journal* on March 2, 1940 (p. 360). The problem is one that interests medical practitioners in their professional work and not only as householders, and their attention may be drawn to a leaflet issued by the Ministry of Home Security (published at 2d. by H.M. Stationery Office) which suggests various means whereby ventilation may be provided without any light showing outside the house. A good deal can be done in this direction apart from any special appliances. For example, the doors of rooms and the windows of unused rooms, also the trapdoor of the loft, can be left open to improve the circulation of the air. In bedrooms as a rule there is no need for the installation of any device: the curtains can be drawn back and the windows opened as soon as the light is extinguished. Again, by very simple means, such as the use of rings or hooks, the bottom part of the black-out material can be arranged to stand away a few inches from the window, care being taken to overlap the side surrounds; or holes can be cut in the black-out curtains and screened by a scuttle of cloth like a tent ventilator. For the rest, some form of ventilator light-trap may be suggested. The principle of the light-trap is that while air currents will flow around corners the light rays travel only in straight lines. Any trap, therefore, must have two right-angle turns and must also be made non-reflecting by painting the interior a matt black. A box arrangement made of wood, sheet metal, or even strong cardboard, can be devised in such a way that with a baffle projecting half-way up through the open end of the box there is ample room for the passage of air without any admission of light. This box is placed at the bottom, or preferably at the top, of the window, and in a room without a fireplace such traps should be fixed both at the top and bottom. An excellent way of blacking out is by means of a window screen containing a ventilator light-trap at the top. A simple form of ventilator light-trap can also be fitted over the top of curtains in such a way that the pelmet acts as the baffle, but it will generally be necessary to make the curtain rail bracket longer to allow sufficient air to pass and to see that the bottom of the curtains is well below the window board.

Many forms of ventilator light-trap can be made by the ingenious, or if the home lacks a handyman they can be bought, as can ventilator blinds, though care must be taken to ensure that they fit the window and also let in enough air. These, of course, are intended only as domestic contrivances. For ventilation in places where numbers of workers are employed more elaborate provision may be necessary and professional advice should be sought.

J. R. Kutscher (*J. Pediat.*, 1940, **16**, 166) records an outbreak of mumps which was cut short by the use of 8 to 10 c.cm. of convalescent serum given to fifty-one susceptible boys aged from 9 to 16 years while attending a summer camp. Only one boy who had had the serum developed mumps, which ran a mild but typical course, while an incidence in from fifteen to twenty-five cases might have been expected. The serum was injected on the fourth day following exposure to the disease.

EXTRA FOOD RATIONS FOR SICK PERSONS

On the recommendation of the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council, which was appointed "to advise from time to time whether it is necessary, on medical grounds, to modify or supplement rations in the case of invalids and other persons on special diets," the Minister of Food has authorized the grant of additional allowances of rationed foods to sufferers from the following diseases:

Diabetes Mellitus.—One extra ration of meat and two extra rations of butter and margarine per week in exchange for the sugar ration.

Spontaneous hypoglycaemia.—Two extra rations of sugar per week.

Steatorrhoea (coeliac disease, coeliac infantilism, and tropical sprue).—Three extra rations of meat per week in exchange for the butter/margarine ration.

Diabetics should complete a form of application which may be obtained from any local food office. The application must also be signed by a qualified medical practitioner.

Applications from sufferers from hypoglycaemia or steatorrhoea should be made in writing to any food office and must be supported by a doctor's certificate, which should give such details as will enable the application to be fully considered by the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council.

Reports of Societies

BLOOD TRANSFUSION SERVICE

At a meeting of the Socialist Medical Association of Great Britain held in London on August 23, with Prof. J. R. MARRACK in the chair, Dr. R. S. Saxton, opening the discussion, deplored the slowness of the authorities here in adopting modern advances of technique which had proved themselves invaluable in Spain, such as the pressure ampoule, but he welcomed the increasing conversion of stored blood into plasma. He stressed the fact that a very low haemoglobin was no bar to survival in a case of chronic anaemia, and that the important factor in the treatment of haemorrhage and shock was replacement of fluid. Dried plasma was as valuable for this purpose as whole blood; it had the advantage of ready portability and would keep indefinitely at room temperature. The quantities at present used, equivalent to 200 c.cm. of plasma, were not dangerous by reason of their agglutinin content, but larger quantities might be. For this purpose group AB plasma was ideal, but the supply was limited (3%). The difficulty could be overcome by mixing Groups A and B before separation of plasma; this resulted in adsorption of the agglutinins. (Prof. Marrack added a word of caution here on the added risk of infection which this procedure would involve.) Among other practical points Dr. Saxton mentioned the danger of mistakes in grouping from cold agglutination and the use of stale sera, the need to feel for a vein that was not obvious, the advantage of arm over leg veins, and the need to cut down on the veins of 10% of shocked patients. He stressed the value of direct transfusion in rural and outlying districts. He did not think that the use of cadaver blood was practicable for military purposes. Nurse DARTON, who had given many transfusions in Spain, said that in the event of heavy bombing not enough doctors would be available for this work, which would have to be done by nurses trained in the work. The great advantage of the pressure ampoule was that, owing to its simplicity, it was especially suitable for use by nurses. Mr. SOMERVILLE HASTINGS thought that people were reluctant to volunteer because so much blood was wasted by the present system. Dr. MCMICHAEL denied this so far as the transfusion centres were concerned, but it was affirmed by a number of speakers that much blood which might have been used as dried plasma was allowed to haemolyse or was wasted in individual hospitals.

Correspondence

Treatment of War Burns

SIR,—In his paper on the treatment of war burns in your issue of August 24 Mr. Sol. Cohen credits me with a picturesque simile that is, I regret to say, not my own, but quoted from a letter I had received from Colonel Leonard Colebrook. This paragraph of which this simile is a part is so pertinent at the present time that, though it was never intended for publication, I should like to quote it.

"The wound at the end of débridement is far from being like the inside of a test-tube or a tea-cup—it is much more like the coastline of Norway, and the majority of any microbes there may be will be lying in culs-de-sac between fascial planes, etc., made either by the injury or the surgeon. If that is so, they will not be reached by any antiseptic used to wash out the wound (even if they are not embedded in small blood clots). You may remember an experiment of Fleming's in the last war. He pulled out a series of spikes on the sides of a test-tube, filled it with a culture or an emulsion of faeces, and put it in a vacuum to get the fluid into all the spikes. Then he emptied it out and poured in antiseptic, which was left for some hours. After emptying that out he filled it up with nutrient broth, which grew abundantly. That in turn was emptied out and an antiseptic put in and so forth—every day for a week. Always the same result—however strong the antiseptic, it never got at the microbes in the spikes.

I think that what we know of antiseptics justifies us in believing that the dettol or flavine put into the wound cannot at best kill many microbes, since it will very quickly be quenched by combination either with fixed tissues (flavine) or with serum proteins. Moreover, it cannot get into the culs-de-sac. On the other hand, it will damage a certain number of leucocytes, which can wander everywhere through blood clot and through tissues. The experiments of Wright and Fleming in the last war showed very conclusively how extraordinarily efficient the leucocytes are at mopping up all sorts of bacteria given the right conditions—that is, warmth, moisture, and a sufficient concentration. I personally feel we should trust them and plan our surgery so as to give them the best conditions."

I have had the good fortune to pay several visits to the Southern Hospital to watch Mr. Cohen and his team at work and to see their results. I should like to congratulate him on them and on the manner in which he has reported them.—I am, etc.,

London, W.1, Aug. 28. W. H. OGILVIE.

Mass Radiography of Recruits

SIR,—It is indeed encouraging to learn from Lieut.-Colonel E. L. Cooper's paper in your issue of August 24 (p. 245) of the progressive and preventive methods of mass *x*-ray examinations of the chests of recruits to the Australian Forces which are being utilized by the Australian Army Medical Corps. In a letter on this subject written to the *Lancet* on July 20 I voiced my regret that this method of miniature screen photography was not as yet available for the examination of recruits to the British Forces, more particularly as it was now known to be, despite its limitations, a rapid, reliable, and economic proposition in the hands of experienced observers. The method can and should be extended ultimately to the whole of the civilian industrial community; and its possibilities, providing the method is used with discrimination, both in war and peacetime economy are tremendous. There can be little doubt that, if we are to continue to make any appreciable progress in the control of pulmonary tuberculosis in the future, it will be essential to recognize that such means of detecting early pulmonary lesions in healthy subjects are an invaluable contribution to preventive medicine, which, no less than the treatment of disease, is the concern of the physician.

The results of Lieut.-Colonel Cooper's survey are of outstanding importance. The fact that 0.55% of presumably healthy subjects were found (primarily by this method) to

have active pulmonary disease indicates the well-recognized "silent" clinical nature of certain cases. The limitations of this method and the need for team work by chest physician, radiologist, and *x*-ray technician are rightly emphasized. Experience has shown that without a technically satisfactory miniature film the method is fraught with danger from the point of view of correct interpretation, even more than is the case with a full-sized chest radiograph.—I am, etc.,

London, W.1, Aug. 26. PHILIP ELLMAN.

X-ray Examination of Service Men

SIR,—The advocates of mass radiography appear to me to overlook certain inherent difficulties in the *x*-ray diagnosis of pulmonary tuberculosis.

1. The shadows seen can only represent the condition at the time of examination. As the manifestation of active disease resulting from earlier infection may be delayed until the resistance is broken down by intercurrent strain or disease, periodical re-examinations of accepted men would be necessary in order to detect tuberculosis in the absence of symptoms or physical signs.

2. The shadows seen are often difficult to interpret, and, where tuberculosis is in question, activity can seldom be settled on *x*-ray evidence alone.

3. The most that *x* rays can offer is the presentation of shadows consistent with the presence of one or more diseases, and clinical investigation is essential.

In this area, where for many years a fair amount of chest radiography has been done at the dispensary, the principle of reference of suspects by medical boards to the tuberculosis officer for detailed investigation, including *x*-ray examination, has worked well. So far it appears that only rarely have medical boards been deceived by deliberate misstatements of known tuberculous (usually semiquiescent) men.—I am, etc.,

Eccles, Lancashire, Aug. 31. GEO. JESSEL.

SIR,—The correspondence that has appeared in the *Journal* on the *x*-ray examination of Service men has proved of great value in stimulating interest in this subject and particularly in that of "miniature radiography" for mass examination of chests of Service men. I am in agreement with Dr. Sparks in most of his views on this matter, and appreciate some of the difficulties he has drawn attention to. In his letter published in your issue of August 24 he observes, "There only remain the XX000 recruits who have now joined the Services who were symptomless and showed no physical signs of disease"—presumably on enlistment. He then states that, in accordance with the findings of the Horder Committee, these cases cannot as yet have the benefit of examination by "miniature radiography." As an alternative he suggests that use should be made of fluoroscopy in the units where the "expert examiners are available." Permit me to suggest that Dr. Sparks is not fully conversant with the organization of the radiological service of the three Services, or I am sure he would reconsider that statement. Further, that the necessary "expert examiners are available in the Services" is not the case.

The solution of this problem appears to resolve itself into two distinct groups: (*a*) men already enlisted and serving; (*b*) men yet to be called up under the group system. Examination of the former group can be performed with reasonable ease and with the minimum disturbance of work of units by sending a mobile motor unit fitted out to do "miniature radiography," to visit the various troops scattered about the country. In other words, it is a case of bringing the mountain to Mohammed. Such a unit has, in fact, already been constructed in this country by the British Red Cross at my direction, and some excellent results achieved. The *x*-ray plant is transported in a lorry, while the necessary electric current is generated from the car engine. This in turn feeds the *x*-ray unit, producing 150 mA with an output of 90kV from a four-valve transformer and making the necessary exposure in 1/10 second. The complete unit is portable and fitted with handles enabling two men to carry it from the van and assemble it indoors in a few minutes, ready for work. As the patients pass through in a queue, stripped to the waist, it has been considered preferable to operate under cover, and particularly in winter, rather than in the lorry itself. The lorry is also to be fitted out with a complete dark-room to undertake any branch of development of radiographic work.

One such unit with adequate staff (and that may mean a dozen assistants including clerks), it is estimated, can examine 2,000 to 3,000 cases a day. Thus in twelve months approximately 1,000,000 men can be examined by one unit. Thus four such units could cover the present armed forces in this country in approximately six months. By resting the *x*-ray tubes with a relief tube, and having relief technicians, larger numbers might be attempted and the time factor reduced. The films could be dispatched to a central depot for examination by a Board of Examiners, or a number of boards be established throughout the country and so more fully employ some of our part-time radiologists.

As to those under the second heading—men yet to be called up—they could be examined by permanent installations of "miniature radiography" in advance of the actual "calling up" and immediately after they have registered. In fact, judging at the present time the speed of the general medical examination, the miniature *x*-ray examination could be completed in advance of the general medical examination. This, in fact, would be an advantage and should be done.

Ten such sets distributed throughout the country could pass through 10,000,000 recruits in twelve months. Already manufacturers have available numbers of the necessary plant. The operation of the units is simple, and, if we do not have available the necessary radiographers, technicians can be instructed in the operation in a few weeks, while the necessary clerical staff is easily available. After the war the plants, if not required for military purposes, will be in demand for industry and the examination of employees. It must be realized that the assistant staff is necessarily large, but it can soon be got together and should be undertaken now.—I am, etc.,

London, W.1, Aug. 29. NORMAN P. HENDERSON.

Anaesthesia in Wartime

SIR,—I have read with interest your letters and articles on wartime anaesthesia, and should like to add my experiences as an anaesthetist to a casualty clearing station which dealt with a very considerable number of wounded. For several reasons, due to our situation, nitrous oxide was very difficult to obtain, and the cylinders we had were reserved for cases that were severely shocked and for gunshot wounds of the thorax and abdomen. Unless I had to administer an anaesthetic to more than one patient at the same time I found that pentothal in large doses was the anaesthetic agent of choice.

The following technique was employed. Premedication: one ampoule of alopon, or morphine 1/6 grain and hyoscine 1/150 grain, depending upon which was available. It was found by experience that most cases for an operation lasting twenty to thirty minutes needed 30 c.cm. of pentothal; after this the dosage diminished very considerably, and an occasional cubic centimetre sufficed to keep the patient quiet during the next hour. The maximum dose I have given is 45 c.cm. for an operation lasting two hours. The only complication is extremely shallow breathing, with cyanosis, which occurred in three cases out of about 200. These quickly recovered with 1 c.cm. of coramine given intravenously.

The advantages of pentothal for our work in a casualty clearing station are: (1) The ease with which it may be sent from the advanced medical stores depot. (2) The prolonged period of sleep following the operation, undisturbed by vomiting or restlessness: this gains the gratitude of the patient and the enthusiastic praise of the very busy nursing sisters. (3) The pleasant induction. (4) The ease of administration.—I am, etc.,

R. HASTINGS MOORE,
Aug. 25. Major R.A.M.C.

A Safe and Simple Tourniquet

SIR,—I would like to draw the attention of interested practitioners to Callender's tourniquet (made by Chas. F. Thackray Ltd. of Leeds). This tourniquet has all the advantages of a Samway tourniquet without its disadvantages, being of soft rubber and having a handle. I recommend its use by first-aid workers.—I am, etc.,

F. B. SHEVLIN,
York, Aug. 31. First-aid Commandant.

The Stomach during Air Raid Warnings

SIR,—Recently five fractional test meals were started just as the sirens sounded a warning. The effect on the meal was interesting. The only case giving a usual result was that of an inspector of 57 years: his stomach emptied in the usual time and the two acid curves were within normal limits. A woman of 73 gave just enough juice for qualitative tests; starch disappeared in two hours; free acid was present in all. A man of 37 gave just enough for qualitative tests; starch disappeared immediately; free acid was present at one hour only. A man of 24 gave no juice at all except a little at half an hour; this showed neither starch nor free acid. A soldier of 26 dried up completely. I tried all the tricks to get some stomach content from him without avail. I then injected 5 c.cm of water; this was recovered immediately, but after a minute only 2 c.cm. could be obtained; then nothing again.

Apparently the pylorus relaxes and passes everything on almost immediately, and just as the mouth secretions may cease so may the gastric.—I am, etc.,

Aug. 31. G. R. OSBORN.

Adrenaline in Asthma

SIR,—In the annotation on electrophoresis of adrenaline in asthma in the *Journal* of August 31 certain disadvantages of the administration of adrenaline by the usual subcutaneous method are mentioned. A large experience extending over thirty years has convinced me that all of these supposed disadvantages are non-existent when a proper technique is employed.

(1) "It may give rise to disagreeable effects"—tremor, palpitation, headache—"from an exaggeration of its normal physiological actions." These can be prevented by giving an initial dose which is found by experience to produce no unpleasant symptoms of any kind; this varies in different individuals between 2 and 5 or occasionally more minims. Thereafter, if necessary, an additional minim can be injected every half-minute or minute. Patients soon learn to recognize the smallest dose required to give relief to each attack according to its severity, and in all or nearly all attacks this is below that which produces unpleasant symptoms, so that the whole dose can be given at once. Complete relief is obtained without the smallest rise in blood pressure or acceleration of the pulse or any subjective symptom beyond relief of dyspnoea.

(2) "Each subsequent administration appears less effective." But a patient may give himself several thousand injections over a period of many years without having to increase the dose. Sometimes, however, in the course of time the dose has to be slightly increased; thus a patient who obtained complete relief with 1 minim in the year 1909 now requires 2 or 3 minims for most of his attacks.

(3) "After prolonged administration it may fail to produce any beneficial results." It is not clear whether this refers to a single prolonged attack (status asthmaticus) or repeated attacks over a period of years. In neither case is it true. I have never met with an "adrenaline-resistant" case of asthma. Even in status asthmaticus continuous subcutaneous injection at the rate of 1 minim every forty-five or sixty seconds (a method I first suggested fifteen years ago) eventually gives relief, though in exceptionally severe cases the continuous injection has to be maintained for an hour or longer.—I am, etc.,

Oxford, Sept. 1. ARTHUR F. HURST.

Protection of Head and Neck in the Desert

SIR,—In a letter published on August 24 Colonel V. St. J. Croley expressed the opinion that lack of protection of the head, neck, and spine is responsible for heat stroke. In the light of many experiments, animal, human, and personal, I am convinced that this is misleading, and would like to outline briefly what I believe to be the true state of affairs.

Tropical sun (as distinct from tropical conditions of life) affects man in two ways. (1) By means of ultra-violet rays acting upon the skin and eyes, causing burning and headache. Protection is afforded by tanning, or in the absence of this by light sunproof clothing, and by Crookes's glasses. The head, in those blessed by Nature with a good thatch of hair, is self-protected. (2) By the heating action of the red end of the spectrum on the body as a whole, either directly or by conduction. This is counteracted by the cooling mechanism of the body acting through surface evaporation of sweat.

In applying these principles it is found that the average European who takes the trouble to tan his skin by graduated exposure, and to wear Crookes's glasses, can stand any amount of exposure to tropical sun without any other protection, provided the humidity of the air is not so high as to prevent rapid cooling of sweat, and that he has the opportunity to replace his loss of salty fluid. If, however, the humidity should rise, or the skin be deprived of contact with moving air, he will immediately become uncomfortable, the pulse rate will rise, and if he does not get out of the sun or into a draught he will be threatened with heat stroke. If he has alcohol in circulation in his blood its depressing effect on his heat centre will increase his symptoms and danger. If he has to remain in the sun the only clothing which will help is a large topee, which acts to some extent like the Chinaman's umbrella hat in keeping sunlight from contact with a fairly large area (depending on how vertical are its rays) of his body. The less clothing he wears the better, because clothes must interfere more with skin cooling than they can protect from the sun.

To illustrate this, I have travelled for days on a camel in the dry uplands of the Sudan with the sun temperature standing at between 120° and 140° F. with no covering but Crookes's glasses and a pair of shorts for decency's sake, and have been perfectly comfortable. This is the normal habit of negroid Sudanese camelmen in hot weather. The lighter-skinned Arab covers himself, not because he is more comfortable so, but because he dislikes to become tanned to the colour of what he considers an inferior race. On the other hand, on the coastal plains during the monsoon, when the humidity is near maximum but the temperature not much over 100°, I have been unable to travel at all during the midday hours without acute discomfort, which the addition of clothing (except for a topee) has only served to increase.—I am, etc.,

C. GRANTHAM-HILL, F.R.C.S.Ed.,
Beccles, Aug. 28. Late Senior Surgeon, Sudan Medical Service.

Ether Convulsions

SIR,—Mr. Hamilton Bailey's article on the subject of ether convulsions (August 17, p. 222) has once more revived interest in this distressing complication in what is probably otherwise the safest form of anaesthesia. Dr. Newton-Andrews's appeal for clarification of the issue is unfortunately one which it is difficult to satisfy, because although the literature on the subject is now extensive there is little agreement as to possible causation. Since, however, the influence of the mode of administering ether has been brought into question it may be helpful to recall one or two facts concerning the administration of ether in general.

Under average conditions the body of an 11-stone patient in a state of deep surgical anaesthesia contains approximately 3 oz. of ether. If anaesthesia is induced in the average patient and maintained for an hour at such a level that good muscular relaxation is present the ether vapour content of the total inspired air will be equivalent to about 8 oz. of fluid ether. These figures do not depend upon the method employed, and variations in the amount of ether used by different methods depend upon (1) using over again some of the ether in the expired air—that is, rebreathing—and (2) the wastefulness of the method employed.

The position with regard to machines such as the Boyle, in which nitrous-oxide–oxygen mixtures are passed through a bottle containing ether, may be explained as follows. Nitrous oxide and oxygen constitute a weak anaesthetic mixture, and when the plane of anaesthesia maintained is a light one this mixture makes a significant contribution to the total anaesthetic effect. When, however, the plane of anaesthesia is a deep one the contribution of the weak anaesthetic agent, nitrous oxide and oxygen, is small, and almost the same amount of ether must be employed as if the medium in which it is given were air or oxygen. In practice it is often found, when using Boyle's machine to produce deep anaesthesia, that the nitrous oxide supply can be cut off and the oxygen supply

increased without making any obvious change in the depth of anaesthesia maintained. On the other hand, if light anaesthesia is being maintained by a current of nitrous oxide and oxygen containing only a small quantity of ether—as, for example, for mastoidectomy—should the nitrous oxide supply be cut off the patient will awaken.

It is unlikely that the temperature of the water in the water bath incompletely surrounding a Boyle bottle can have any significant effect upon the temperature of the ether vapour reaching the patient. It can and does affect the amount of ether vaporized by a given quantity of gas mixture passing through the bottle, but this is a matter which is controlled by clinical observation of the patient's level of anaesthesia. Further, the amount of heat which the patient receives from the warm water must be insignificant. The temperature of this water must be below 35° C., otherwise the ether will be seen to boil; and even if the patient were to *drink* several pints of such lukewarm water, thus absorbing its heat in a much more efficient manner, it is hardly likely that he would become "overheated."

Three cases of ether convulsions have occurred in the practice of this hospital during the past eighteen months. Strangely enough one occurred using a closed-circuit carbon dioxide absorption machine, one when a Boyle machine was employed, and a third with the open drop method. In the third case anaesthesia was again induced one week later using a method, details of which will shortly be published, by which warmed ether vapour *is* given, but no untoward symptoms of any kind were then noticed.[1] In all of these cases the patient's temperature was raised during the convulsions, although it was not raised before the onset of the anaesthesia. In one of the cases the temperature of the operating theatre was only at a moderate level, but the patient was almost completely covered by mackintoshes, so that heat lost from the body surface must have been much reduced. All three cases recovered, and in two the convulsions were satisfactorily controlled by the use of soluble hexobarbitone.

Though agreement concerning causation is absent among those who have written on this subject, there does seem to be a considerable measure of agreement that overheating of patients while under ether anaesthesia should be avoided. If convulsions occur most authorities agree that the intravenous injection of soluble hexobarbitone, combined with the administration of oxygen where possible by positive pressure insufflation, offers a very fair probability of controlling the convulsions, and this is confirmed by the limited experience of this trouble in this department.—I am, etc.,

E. A. PASK.
Nuffield Department of Anaesthetics.
Radcliffe Infirmary, Oxford, Aug. 27.

SIR,—Mr. Hamilton Bailey (August 17, p. 222) draws attention to the condition styled "ether" convulsions, and speculates upon the pathology of the condition. In view of the fact that the exact pathology is not apparently agreed upon among surgeons and anaesthetists I should like to contribute my surgical observations on the condition.

First, the name appears to be a misnomer, as the convulsions would not appear to be directly due to any toxic substance in the ether, as the same bottle may be used for subsequent cases without a hint of mishap. In the second place I recognize a strong toxic element in the majority of cases in which I have seen the condition—the cases often being children with acute appendicitis, peritonitis, or osteomyelitis; and I think also that in these cases a marked element of dehydration is present, as shown clinically by much vomiting and a sunken condition of the eyes. I would therefore tentatively like to suggest that the convulsions are cerebral in origin due to cerebral anoxaemia resulting from stagnation of cerebral circulation consequent upon the dehydration and increased viscosity of the blood, and the enfeebled heart action resulting from toxaemia. In support of this suggested pathology I have noted that the majority of cases have been seen to be mildly cyanosed before the onset of the convulsions, and I also note that the majority of the cases developing this condition have been having a "semi-closed" type of anaesthetic such as is frequently given on the standard gas-and-oxygen machine, in which it is particularly difficult to avoid those milder degrees of cyanosis which are of little moment in a healthy subject.

I venture to suggest that this type of anaesthesia throws greater strain upon the cardio-respiratory system than does open ether given with added oxygen, especially in a child, and that it frequently precipitates the condition of cerebral convulsions under anaesthesia in these cases, already predisposed to its development by factors already mentioned.

Mr. Hamilton Bailey does not specify the method of anaesthesia in use in his cases, but I would venture a forecast that it was of the type mentioned above. He rightly emphasizes the deadly nature of the condition—if the patient does not stop convulsing shortly after withdrawal of the anaesthetic he will usually keep them up till death from exhaustion.

I have not had the opportunity to try evipan, but it is possible that the onset of the condition might be avoided by the immediate counteracting of the earliest and mildest degree of cyanosis, and the avoidance of semi-closed methods of anaesthesia in toxic cases. I think it was with something of this view at the back of his mind that an elderly anaesthetist used to say, "The oxygen supplied by Nature is better than that supplied by an oxygen company."—I am, etc.,

JAMES GORE, F.R.C.S.
Selly Oak Hospital, Birmingham, Aug. 23.

SIR,—Mr. Dickson Wright reproves me for omitting to have the rectal temperature recorded during a case of ether convulsions. I am always open to suggestions, particularly those which will help to throw light upon abstruse problems. However, with a patient having convulsions of a most violent character, with the whole of the theatre staff, including the porter, either giving their full efforts to the patient's resuscitation or holding him on the table, with the patient's legs strapped to the table in order to further this end, and with the laparotomy wound open and the intestines prolapsing with each fresh convulsion, I am at a loss to understand how it is possible to get at the rectum, let alone how to keep a glass thermometer therein.—I am, etc.,

London, W.1, Sept. 2. HAMILTON BAILEY.

Dental Disease in Pregnancy

SIR,—It was very stimulating to read Mr. James Campbell's letter (August 24, p. 268) on dental disease in pregnancy concerning, as he puts it, "that hardy annual—the belief that pregnancy leads to a withdrawal of calcium from the teeth, and hence to increased dental disease at that time." For some years I have kept a check on my treatment charts of patients before, during, and after pregnancy, and I cannot find any evidence for the belief. It is quite true that at times I have found an increase in dental caries following pregnancy, but quite as often I have found a decrease. Generally, however, there does not appear to be any difference in the susceptibility. It would surprise me were it otherwise, since, even allowing for divergence of opinion regarding correct diet and mode of living, pregnancy is still a physiological and not a pathological condition.—I am, etc.,

D. S. HAYTON-WILLIAMS, M.R.C.S., L.D.S.
Oxford, Aug. 26.

Leptospiral Infection

SIR,—I was much interested to read Dr. Alston's paper in the *Journal* of August 24, in which his experiments upon rabbits suggest that the administration of therapeutic serum in suspected cases of leptospirosis may give rise to a positive agglutination, even in the absence of the infection. It has been held in the past, especially by Prof. Schuffner (*Proc. roy. Soc. trop. Med. Hyg.*, 1934, **28**, 7) and Major H. C. Brown (personal communication), that this is not so; and two cases treated by myself and described in the *Journal* of December 31, 1938, seem to support this view.

In the first a boy of 20 appeared to be suffering from Weil's disease. Laboratory investigations supported this suspicion, and he was given 40 c.cm. of serum on the third day of his illness. On the fourth day, after a further 40 c.cm. of serum, his blood showed a completely negative agglutination reaction. Two days later, after a further 60 c.cm. of serum, the reaction was positive at a dilution of 1 in 3,000. Making calculations along the lines suggested by Dr. Alston, his blood might well

[1] *Lancet*, 1940, **2**, 97.

have been positive at a dilution of 1 in 300 when first examined. In the second case, after 60 c.cm. of serum, the agglutination reaction was positive only at a dilution of 1 in 10, while after a further 40 c.cm. it was positive at 1 in 1,000 three days later.

I would suggest that the finding of a positive reaction, owing to the administration of serum, is, in the absence of a previous infection, very strong evidence of infection by the leptospira. Where there is any doubt a second examination should be carried out after two or three days—when a rising titre will clinch the diagnosis.

Dr. J. C. Brown has just repeated agglutination tests upon the blood of five recovered cases, which have been under my care during the past four years. As he returned a positive finding at various dilutions in all five cases it is important to remember that a positive reaction may indicate nothing more than an old infection; and where the clinical state and laboratory findings are not strongly in support of the diagnosis a second test should always be performed.—I am, etc.,

KENNETH M. ROBERTSON, M.D., M.R.C.P.

Winchester, August 26.

Injection Treatment of Muscular Rheumatism

SIR,—With reference to Mr. Martin Button's article I would like to draw attention to a paper, "Diagnosis and Treatment of Muscular Rheumatism" (*Brit. J. phys. Med.*, 1938, **1**, 302), in which I claimed that non-articular rheumatism is a muscular disease characterized by "myalgic spots." It was shown that these myalgic spots, of which the patient is not aware, give rise to heterotopic or referred pain; are, as a rule, localized at the origin, insertion, along the edge or along the course of a muscle or muscles; and can be diagnosed by objective signs. It was claimed that rheumatic myalgias can be cured by an appropriate treatment applied to the tender spots *only*. The commonest myalgic spots of the body are shown diagrammatically in the *British Journal of Physical Medicine* (1940, **3**, 46). So far as my experience goes the myalgic spots are the same in acute, subacute, or chronic rheumatic myalgias, in myalgias of traumatic or of unknown origin (idiopathic myalgia).

The treatment of non-articular rheumatism is by injections of procaine into the myalgic spots. A 0.25% solution is used without adrenaline; 1 to 2 c.cm. is injected into each. In this way untoward after-effects described by Button are avoided. Provided the myalgic spots are exactly localized—for example, in lumbago I find them regularly at the outer edge of the quadratus lumborum muscle—the pain is relieved almost instantaneously by the injection, and the patient is able to exercise such movements as he could not perform before the injection because of pain.

Since the minimum amounts of procaine described above fail in their effect if the myalgic spots are not accurately located, I am inclined to believe that the more massive but also successful injections of procaine or proctocaine commonly in use for lumbago act by virtue of the fact that the myalgic spots are accidentally included.—I am, etc.,

London, N.W.11, Aug. 20. M. G. GOOD, M.D.

The Periodicity of Sun-spots, Influenza, and Cancer

SIR,—A possible physical basis for the periodicity of influenza and cancer is suggested by analysis of charts of the monthly sun-spot numbers from 1796 to 1937.[1] These show that the phenomena I have described lately in cancer periodicity[2] (the full-, half-, and "missed"-periods, the rare quarter-periods and "plateaux," and the seven-year (less two weeks) recurring cycle of dates at thirty-three-week intervals) are represented in frequently recurring series in the minor sun-spot oscillations. If these are due to tidal planetary effects on the circulating solar atmosphere then one "period" corresponds closely to an orbital revolution of Venus, and two periods to five of Mercury. The seven- and eleven-year periods are best known in studies of maximal annual growth rings in trees (as by Prof. A. E. Douglass of Arizona).

[1] Wolf and Wolfer: *Monthly Weather Review*, Vol. 30 and foll. Quoted by H. T. Stetson in his *Sunspots and their Effects*, 1937. New York.
[2] Webster: *The Periodicity and Cause of Cancer*, 1940.

That there is a frequent correspondence in dates between cancer recurrences and the influenzal periods has been referred to by me (Webster, 1940, p. 55); this and the often close correspondence between the monthly sun-spot oscillations and influenzal "waves" (as, for instance, in the three pandemic waves of 1918–19) suggest the possible causal relationship of minor sun-spot cycles to cycles of virus activity in influenza, and in cancer and the allied neoplastic diseases.—I am, etc.,

London, W.1, Aug. 30. J. H. DOUGLAS WEBSTER.

Obituary

J. S. EDKINS, M.A., M.B., Sc.D.

Late Professor of Physiology, University of London

The recent announcement of the death of John Sydney Edkins at the age of 77 must stir the memories of many medical men, particularly those who owe their allegiance to St. Bartholomew's Hospital, for whose education as students he was partly responsible. Edkins received his early education at the City of London School, and entered Cambridge University as a scholar of Caius College in 1881. His ability was early evident in the fact that he obtained two open scholarships to Caius—one in natural science and the other in mathematics. His decision to study the former of these subjects and ultimately to become a physiologist he always attributed to the stimulus of reading Huxley's *Physiology* as a schoolboy. Studying and researching under Michael Foster only served to quicken his appreciation of physiology and finally to determine that medical science should be his life's interest. After leaving Cambridge he became demonstrator to Stirling at Owens College, Manchester, and passed from there to be Klein's assistant at St. Bartholomew's. When Klein retired in 1903 Edkins, although a St. George's man, was appointed his successor. The appointment of a member of one hospital to the staff of another was at that time a rare occurrence.

In order to exist in those days it was usually necessary for a physiologist to be a "pluralist," and, like Sherrington, Brodie, Leathes, and many others, Edkins had perforce to take on other teaching, so that in addition to the work at St. Bartholomew's he became lecturer in physiology at Bedford College for Women. Thus, at the time when he might be expected to be most fertile from the point of view of research, much of his energy had to be directed to teaching. This he did in no perfunctory manner, and the great success he won in this field was well merited. His lecturing was never stereotyped and, although much of his time was primarily occupied during his earlier years in preparing students for examinations, he always succeeded in avoiding that sense of hurry and pressure which is so often the distinctive feature of the modern cramming method of successful teaching. In developing any subject he used a logical technique of the question and answer type, and with a leisureliness which made his lectures both enjoyable and stimulating. In 1914 Bedford College decided to make the post of physiologist a whole-time one, and he thereupon resigned from St. Bartholomew's Hospital. In a new laboratory and in the delightful surroundings of Regent's Park he was able to shed the drudgery of continuous lecturing, travelling, and divided interests. Most of his efforts were then directed to the building up of an honours school of physiology at Bedford College in particular and in London University in general. His success in this field is well known. A substantial portion of the women physiologists in this country during the past twenty years owe their careers to Edkins. Many of these could be mentioned, but it is of especial interest to note that Nora Tweedy, who first as a friend and then as a student of honours physiology became his demonstrator, and then his second wife, ultimately followed him as a successful head of the department at Bedford College when he retired from the professorship in 1929—a remarkable record.

Practically all the investigations made by Edkins dealt with the functions of the stomach. As George Henry Lewes student at Cambridge he collaborated with Langley in studying pepsinogen granules in the stomach mucous membrane. His best-known work is that which led him to formulate the presence of gastrin in the epithelium of the pyloric end of the stomach as a hormone for gastric secretion. This work has been a source of much discussion and, with the discovery of histamine and its effect of promoting acid secretion from the stomach, there was at one time a feeling that the gastric effects were probably due to this substance. In recent years, however, a number of publications have supported the view that histamine and gastrin are not identical. Although, therefore, his work on gastrin cannot yet be regarded as fully accepted, it receives substantial support. The last subject of study he published was an interesting account of the presence of spirochaetes in the gastric mucous membrane and the changes they undergo during digestion.

Unlike most scientific men, Edkins had many interests outside his professional work, especially in all kinds of amateur sport. As a student he was in the Caius first boat. At a later stage he took up croquet, and not only was he in the first flight as a player, but in this as in most of his other interests his delight in human contacts led him to play a prominent part in the control and development of the game. He was a member of the Croquet Association for thirty years, and in the years 1935–7 its president. Here again his intellectual outlook got full scope, and he played a leading part in transforming this game from the garden-party status of thirty years ago to its present transcendental position, where the highest skill and the keenest sense of strategy and tactics are necessary for success.

Any life which, as in this case, has brought an increase in knowledge of medical science, a large transfusion of learning in the best scientific spirit, and a general helpfulness to fellow men in many other fields of activity can only be regarded as truly blessed.

LIONEL ALEXANDER WEATHERLY, M.D.

Much regret will be felt by a wide circle of friends at the passing of Dr. L. A. Weatherly, who, at the age of 88, died at Bournemouth on August 30. Up to the last he continued in active practice as an alienist with faculties unimpaired, displaying in his day's work all the acumen and wisdom of years and of unexampled experience. The following is extracted from an appreciation written by Dr. S. Watson Smith.

Weatherly qualified in 1873, so that he had been a member of the medical profession for no less than sixty-seven years, being doyen of that earnest band of men who continue to devote their lives to mental medicine. His influence, directing itself always towards an enlightened and humane management of the victims of mental disorder and disease, was animated by a keen insight into and understanding of all those problems and difficulties that beset the question.

Weatherly's father was a medical man who in the middle of the last century practised at Portishead, Somerset—a Middlesex yeoman who had thirteen children, of whom Lionel was the fifth child. Fred Weatherly, the barrister and song-writer, who died in 1929, was his elder brother. At an early age he was sent to a dame school in Bristol; thence, after a time, to All Saints School, Bloxham, where, in one of his wild escapades on a "stolen" horse, he suffered a fractured skull. As he afterwards said: "It was considered that I had cracked my skull; many think that the crack has remained ever since!" Leaving school in 1865, Weatherly was apprenticed to his father at Portishead. Not only did he there learn the art of dispensing, but on professional rounds dressed wounds and assisted at minor operations, so obtaining a good grounding in his profession. His father was a doctor of the old school, was never idle, and took no holidays, his dominating interest being his patients, to whom he was friend and counsellor as well as medical adviser. He brought up his eight sons to work, insisting always that the education such as he procured for them—he sent five of his sons to the university at considerable money sacrifice to himself—was all they need expect; that it lay with them to fit themselves thereby for their life's work without further assistance from him. Many celebrated people visited his father, including Martin Tupper, who wrote *Proverbial Philosophy*; Samuel Warren, author of *Ten Thousand a Year* and *The Diary of a Late Physician*, close friend of W. E. Gladstone, with whom Warren was a fellow student at Christ Church. If a prize were won at school or university by any one of the Weatherlys a postcard was sure to arrive soon after from Gladstone, who constantly took an interest in the doings of the various members of the family. Lionel Weatherly was sent to Dresden to complete his schooling. He was in Dresden when Prussia declared war upon Austria, and Saxony joined Austria to oppose the Prussian bid for supremacy; and saw cheering, marching troops, and, later, grief and sadness following the defeat of the Saxon and Austrian armies at Königgratz. In April, 1868, after two happy years in Germany, he started for home. On arrival he at once began to prepare for the preliminary medical examination. This over, in the same year he entered as a student at the Bristol Medical School and Bristol Royal Infirmary. Under the aegis of Mr. Augustine Pritchard he started work in the wards, and during his second year became dresser to Mr. Pritchard, who was then senior surgeon. After two years at Bristol Weatherly proceeded to the University of Aberdeen. First impressions of Marischal College and its lecturers were decidedly favourable; he had, all his life, happy memories of Prof. John Struthers, who, as lecturer, made the dry bones of anatomy fascinate, and whose lectures were made the more interesting by the coloured-chalk blackboard drawings of James Reid.

While a student at Bristol Weatherly was Clark Scholar and gold medallist in medicine. In 1873 he qualified M.B., C.M. at Aberdeen; in 1874 M.R.C.S.Eng.; and in 1877 obtained the M.D. of Aberdeen. For thirteen years he was in medical practice on his own account in Somerset, being for part of that time deputy coroner for a wide area of the county. Thereafter he became owner and resident licensee of Bailbrook House mental hospital at Bath. His name is linked with the early phase of the campaign against consumption, and with the planning and building of Winsley Sanatorium (of which he was founder) for the consumptive poor of Somerset, Gloucestershire, Wiltshire, and the City and County of Bristol. For the long space of sixty-six years he was a member of the British Medical Association. In 1898–9 he was president of the Bath and Bristol Branch; in 1930–1 president of the Bournemouth Medical Society. At the 1934 Meeting of the B.M.A. at Bournemouth Weatherly was president of the Section of Mental Diseases. He was an original member of the London Medico-Legal Society, till recently attending regularly its meetings; in fact Weatherly was probably the originator of that society, of which he was recently created a vice-president.

Weatherly contributed articles to medical journals, and published jointly with the late J. N. Maskelyne *The Supernatural*, writing against spiritualism and fraud associated therewith. In 1918 he published *A Plea for the Insane*. His occasional addresses delivered in recent years to the Medico-Legal Society and elsewhere were full of reminiscence and historical fact, always being a pleasure to listen to. All that Weatherly wrote and said and did was characterized by a broad humanity and by good common sense, his opinion upon any subject exhibiting a well weighed and sensitive judgment. He constantly championed the cause of the mentally afflicted, pleading for the better care and education of the feeble-minded, and against the injustice of their punishment for crime, for which he always held them to be irresponsible; and he did everything possible to advance the more humane treatment of the insane. He drew attention to the fact that alienists frequently received scant treatment at the hands of judges, and he played a large part in the fight for the admissibility and recognition of the alienist's evidence in courts of law. He constantly insisted on the wisdom and justice of recognizing grades of murder in answer to the McNaghten rules, but was against the abolition of the capital sentence where death is the only punishment which can be meted out. He could not conceive of anybody these days doubting that such a disorder as kleptomania existed; he believed it was the outcome of lack of proper guidance and education in youth with failure to

correct the habit, so that a normal acquisitive instinct failed of development, systematic thieving happening as the sequel.

Weatherly came of a long-lived stock, and was active and at work up to the last. Always musically inclined, he did much to encourage an interest in the art while he lived at Bath. He was a fine extempore speaker, never using notes, which he found to be only an encumbrance. He liked nothing better than to enter into some controversial fight or other as if to counter the monotony of things. He was looked up to by his patients, who loved him as a father; in return he loved them all, finding time to listen to their troubles and grievances, which he took pains to relieve in the way best suited to each. Weatherly in reminiscent mood was a joy to listen to; he was an excellent raconteur with a sharp wit and a keen sense of humour. In the course of his early life in the West Country he appears to have become acquainted with everyone there who mattered, with many who became famous or notorious in their various spheres. Weatherly had always a happy, contented life; he radiated cheerfulness and inspired confidence wherever he went; he was without fear. He used to say that he would prefer no better epitaph than the words: "He knew, he loved, he understood humanity."

S. W. S.

JULIUS VON HOCHENEGG

Professor Grey Turner writes:

Even in these preoccupied times the death of the venerable Professor Julius von Hochenegg of Vienna at the age of 81 should not be allowed to pass without brief notice. He was of the rapidly disappearing band of those who served as assistants to Billroth, and the position he occupied for so long in the Vienna School was a tribute to the influence of his great master. Hochenegg was a contemporary of von Eiselsberg, who died last year, and was in charge of the Second Surgical Clinic in the Allgemeines Krankenhaus. His name is especially associated with the surgery of malignant disease of the rectum, in which he had a unique experience. In the management of this condition he was an advocate of the transacral operation, and his results were certainly very satisfactory. In 1929 one of his pupils published an account of over 1,000 operations for carcinoma of the rectum which had been carried out in the Hochenegg service, and that contribution gives a very good idea of his work in this field.

A morning spent in his clinic in 1912 remains a most vivid recollection. To begin with, the background was most striking, for the operations and demonstrations were conducted in an old-fashioned theatre which may have been the very one represented in the classical picture showing Billroth at work. Certainly the visitors were arranged in high galleries, the surgeons were crowded round the table and beards were conspicuous, while there was no question of face masks or any of the trimmings which have since become so universal. Evidently the morning had been carefully prepared and everything went splendidly. He first operated on a woman with carcinoma of the rectum, and then gave an interesting demonstration on the operation by means of diagrams. He also took great pains to give us the details of the after-treatment, and I remember that he brought one or two patients from the wards for dressings, and not only those who were doing well. In the corridor outside the theatre there was a very fine show of pathological material, and we were astonished at the large amount of bowel which had often been removed.

But like the other Viennese surgeons of those days Hochenegg was an all-round man, and I was very stimulated in passing through his wards to see many interesting cases in other fields of surgery. It was on this occasion that I was fired with enthusiasm by the case of a patient in whom, under Hochenegg's direction, one of the assistants had made an anastomosis between the dilated oesophagus and the cardiac end of the stomach. The operation had been carried out through the chest and the result appeared to be most satisfactory. The Billroth Museum was attached to the clinic, and I recall with what interest we were shown the specimen from the first partial gastrectomy for cancer. This operation had been carried out by Billroth in 1881. There was also a coloured drawing of an advanced carcinoma of the breast which had been painted by Billroth when an assistant in Berlin in 1854 and had been used for teaching purposes during all the intervening years. At that time Hochenegg was in his prime at 53 years of age, and was a tall, strong, distinguished-looking man with a short bushy beard. In those far-away happy days he enjoyed a fine practice and was influential and popular in court circles, but in later years not only the tragedy which befell his country but domestic trials darkened his declining days. His name must ever be remembered as one of the very worthy torch-bearers of the Vienna School, and there are many surgeons to-day who must be grateful to him for his example.

J. C. NIVEN, M.B., Ch.B.

We regret to record the untimely death on June 3 after a brief illness of Dr. James Cumming Niven, Malaria Research Officer at the Institute for Medical Research, Federated Malay States.

A son of Dr. W. D. Niven, Professor of Church History at Glasgow University, he qualified M.B., Ch.B. in 1932 at Aberdeen, where he later held a Carnegie Medical Research Scholarship in physiology. In 1939 he gained the degree M.D. of the same university. Joining the Institute for Medical Research in 1935, he made valuable contributions to our knowledge of malaria therapy and prophylaxis, his investigations including the study of the action in malaria of a number of proprietary drugs. His critical studies on prontosil, atebrin-musonat, paludex, marphasen, and other lesser-known remedies have done much to clarify opinion on their value. By his death at the early age of 31 a promising career has been cut short; the country has lost a valuable research worker; and his colleagues mourn the loss of a genial associate whose place in the Institute will not easily be filled. His outside interests were varied. At the time of his death he was the energetic secretary of the Malaya Branch of the British Medical Association and a former secretary of the Selangor St. Andrew's Society. He was keenly interested in sport. An enthusiastic volunteer, he held the rank of lieutenant in the Field Ambulance Section of the F.M.S. Volunteer Forces.

A colleague writes: The sudden death of "Tubby" Niven at the early age of 31 comes with the bitterness of personal loss to his wide circle of friends. A modest retiring Aberdonian, tolerant and taciturn, his qualities of mind and character were perhaps less evident to the world than to those of us who were privileged to share his confidence in work and play. I had known "Tubby" for over five years: as a new colleague, dour, silent, reflective; and in later years as a staunch and loyal colleague and friend. His were the qualities which shine less on the surface than in the recesses of a personality rich and varied. Generous in appreciation, slow to criticize or condemn, he had a Scotch caution of utterance which masked a lively intelligence and a mind which from wide and critical reading and a retentive memory ranged wide beyond the daily task. Shy with strangers, his dry humour, his reflective silences, and his quiet good fellowship will remain for many of us happy memories.

Dr. CLEMENT CORNELIUS CALEB, who died on August 26 at Worthing in his seventy-ninth year, was formerly professor of physiology at King Edward's Medical College, Lahore. He was an Indian by birth, a member of the Indian Christian Community, but was educated in England. He studied medicine at King's College, London, and Newcastle-on-Tyne, and took the M.R.C.S. and L.S.A. diplomas and the M.B. degree of Durham University in 1884, and the M.S. in the following year. At King's he won a senior medical scholarship and was elected an Associate of the College. Returning to India when the Punjab Medical College was opened in 1885 and the former medical school at Lahore was raised to the rank of a university, he was appointed the first professor of physiology, and held that post for nearly thirty years, being also out-patient surgeon to the ophthalmic and aural departments of the Mayo Hospital, Lahore. He received the gold medal of the Kaisar-i-Hind order, first class. After his retirement he settled at Worthing, where he was ophthalmic surgeon to the school eye clinic of the Worthing Education Committee.

Universities and Colleges

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—P. A. Bachmann, S. Hossain, E. R. Jones, A. G. McPhillips, N. A. St. C. Marley.

MEDICINE.—P. A. Bachmann, F. B. Beaver, E. F. Gleadow, C. M. Isherwood, J. T. Morgan, A. L. H. Smith, H. M. Wright.

FORENSIC MEDICINE.—P. A. Bachmann, F. B. Beaver, E. F. Gleadow, C. M. Isherwood, J. T. Morgan, A. L. H. Smith, H. M. Wright.

MIDWIFERY.—P. A. Bachmann, E. W. Crews, J. Gask, S. A. Hossain, D. W. Mayman, A. T. M. Wilson.

The Diploma of the Society has been granted to P. A. Bachmann, A. G. McPhillips, E. F. Gleadow, A. T. M. Wilson, C. M. Isherwood, H. M. Wright, J. T. Morgan.

The Services

NAVAL AWARDS

The following name is mentioned in award made by the King for good services in operations off the Dutch, Belgian, and French coasts:

D.S.C.

Probationary Temporary Surgeon Lieut. David William Pugh, R.N.V.R. (H.M.S. *Whitshed*).

ARMY AWARDS

The King has made the following awards for distinguished services in the field:

Military Cross

Lieut. (temporary Captain) John Devine, R.A.M.C., Supplementary Reserve.

Lieut. David William Evans Lloyd, R.A.M.C., T.A.

Lieut. Harold Jackson Browne, R.A.M.C., Supplementary Reserve.

CASUALTIES IN THE SERVICES

Dr. James Stirling of the West African Medical Service, Nigeria, lost his life when the s.s. *Accra* was torpedoed and sunk on July 26. He leaves a widow.

Missing

Surgeon Lieut. Terence Arthur Mears Maunsell, R.N. (H.M.S. *Glorious*).

DEATHS IN THE SERVICES

Major-General RICHARD WILLIAM ANTHONY, C.I.E., Indian Medical Service (retired), died on August 16, aged 66. He was born on May 18, 1874, at Allahabad, and graduated M.B., C.M. of Edinburgh University in 1897, subsequently taking the F.R.C.S.Ed. in 1909. Entering the I.M.S. as surgeon lieutenant on July 27, 1898, he became lieutenant-colonel on January 28, 1918, and major-general on January 11, 1928, retiring on November 5, 1929. He was posted to the Bombay Presidency on arrival in India. In 1901 he served in the Ogaden punitive expedition in Jubaland, East Africa, receiving the African medal and clasp. In June, 1906, he was posted to civil employ, but reverted to military duty from November, 1914, to November, 1919, and served in the war of 1914–18 in medical charge of the hospital ship *Sicilia*, and later as commanding officer of No. 1 Indian General Hospital at Karachi. Appointed Civil Surgeon and Superintendent of the Medical School at Hyderabad, Sind, in 1919, he held that post until 1926, when he was appointed to act as Surgeon General, Bombay, being confirmed in 1927. He was made a C.I.E. in 1929. After his retirement he lived in Jersey and at Lostwithiel. He had been a member of the British Medical Association since 1904.

R. Boullie (*Thèse de Paris*, 1940, No. 63), who records an illustrative case, states that the presence of foreign bodies in the rectum may be due to their having been swallowed or to their having been introduced through the anus. Foreign bodies introduced through the anus consist of instruments used for escape from prison, diamonds, pipe stems, pieces of wood, pebbles, jam pots, etc. Boullie's case was that of a man aged 57 in whom a bicycle pump was introduced into the rectum during a drinking bout. The object was removed under general anaesthesia and recovery was uneventful.

Medical News

The Federal Council of the Medical Association of South Africa (B.M.A.) has decided to hold no Annual Scientific Meeting while the war continues. This is in accordance with the policy adopted in 1914–18. But for the war this year's congress would have been held in Durban.

The Congress of the Association of French-speaking Doctors of North America will be held at Trois-Rivières, Quebec, from September 9 to 12, under the presidency of Dr. C. De Blois.

The B.B.C. announces that in a new series of talks to schools on general science the first subject to be considered is "Microbes as Friends and Foes." The series begins on September 11 at 2.20 p.m., and will be continued until October 23.

The fourth Argentine Congress of Obstetrics and Gynaecology will be held in Buenos Aires in the second fortnight of October, under the presidency of Dr. Juan Carlos Ahumada.

At the annual session of the American Medical Association Dr. Chevalier Jackson, the well-known laryngologist of Philadelphia, received the Distinguished Service Medal and Citation. Previous recipients have been Dr. Rudolf Matas, the New Orleans surgeon, and Dr. James B. Herrick, the Chicago cardiologist.

The A.R.P. Co-ordinating Committee (chairman, Prof. J. B. S. Haldane, F.R.S.; vice-chairman, Prof. J. R. Marrack, M.D.) has asked Sir John Anderson to receive a deputation on September 16, when representative bodies from many parts of the country will urge points which the committee believe to be extremely urgent if unnecessary loss of life from bombing attacks is to be avoided. The main proposals it is intended to put forward are as follows. (1) The widespread and immediate construction of the "two-stage" type of shelter advocated by the committee. (2) A complete overhaul of the warning system. (3) Reframing of the machinery of the A.R.P. scheme generally, and, in particular, reconstituting the office of the Regional Commissioners, so that the local authorities have adequate representation. (4) An immediate adjustment of the "priority" system and the taking of other steps to ensure that supplies, especially of steel and cement, are made available for shelter construction. Inquiries should be addressed to the Secretary, A.R.P. Co-ordinating Committee, 85, Beechwood Road, Sanderstead, Surrey.

Dr. H. P. Newsholme having resigned his appointment as professor of public health in the University of Birmingham, Dr. G. A. Auden has been elected acting professor for the duration of the war.

The Committee of Privy Council for the Organization and Development of Agricultural Research has appointed to fill vacancies on the Agricultural Research Council, Prof. W. W. C. Topley, M.D., F.R.C.P., F.R.S., Prof. E. J. Salisbury, D.Sc., F.R.S., and Prof T. J. Mackie, M.D., D.P.H., F.R.S.Ed.

A gift of £1,000 has been made by the Rockefeller Foundation to the Royal Society of Medicine to enable it to remove a large number of the older periodicals from the headquarters in Wimpole Street, London, to a suitable place in the country. A member of the Society's library staff will be put in permanent residence in the house for the duration of the war, and by telephonic communication with the library staff in London he will provide all information from the books under his immediate charge in the same way as he would have worked had the books remained in London. This means that the abstracting and bibliographical services and the photostatic service will function as usual, and that there will be no bar to the borrowing of books.

Simple recipes showing how milk can be used in making a variety of savoury and sweet dishes are contained in a memorandum entitled *Milk—Ways of Using Nature's Best Food*, issued by the Board of Education.

The issue of *Schweizerische medizinische Wochenschrift* for July 30 is devoted to military medicine.

Professor Olivier has been elected president of the Société Française de l'Histoire de la Médecine.

No. 33

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended August 17, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1940					1939 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	125	8	51	2	2	17	2	9	—	—
Deaths		1	4				—	—		
Diphtheria	709	28	340	35	31	742	51	156	29	29
Deaths	21	—	8	—	2	14	1	2	1	1
Dysentery	51	7	45		—	39	9	30		—
Deaths			1	—	—			1	—	—
Encephalitis lethargica, acute	3	—	—		—	1	—	3		—
Deaths		—	1				—	1		
Enteric (typhoid and paratyphoid) fever	168	6	22	7	1	48	3	9	8	2
Deaths	—	—	—	—	—	4	—	—	—	—
Erysipelas		12	45	1	3		29	43	2	5
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years										
Deaths	35	5	6	10	6	43	11	6	11	3
Measles*	8,057	45	405		4		22	34		3
Deaths	7	—	5	1	—	2	—	—	1	—
Ophthalmia neonatorum	95	14	17	1	—	100	13	30	—	—
Deaths										
Pneumonia, influenzal†	375	12	—	—	4	350	15	4	2	7
Deaths (from influenza)	6	—	—	—	1	10	1	—	—	—
Pneumonia, primary			121	—				115	6	
Deaths‡		14		6	4		7		5	7
Polio-encephalitis, acute	5	—				3	1			
Deaths										
Poliomyelitis, acute	36	2	4	—	—	25	7	1	1	—
Deaths		2	1				1	—		
Puerperal fever	5	5	15	—	5	6	6	16	3	1
Deaths		1§					—			
Puerperal pyrexia	134	7	9		—	169	16	27		3
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,310	37	137	18	59	1,260	108	204	50	69
Deaths	1	—	—	—	—	1	—	—	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough*	943	8	43		19		184	30		6
Deaths	3	—	1	1	3	8	2	1	—	—
Deaths (0-1 year)	248	26	41	25	25	260	53	37	21	10
Infant mortality rate (per 1,000 live births)						41	48			
Deaths (excluding still-births)	3,926	662	509	148	121	3,792	683	516	168	110
Annual death rate (per 1,000 persons living)			10.3	9.9	10.6	9.3	8.8	10.4	11.3	9.7
Live births	5,860	956	826	300	195	6,533	1,158	848	325	236
Annual rate per 1,000 persons living			16.7	20.0	17.1	16.0	14.9	17.2	21.8	20.7
Stillbirths	253	27	46			245	45	47		
Rate per 1,000 total births (including stillborn)			53			37	32	53		

* Made notifiable generally on November 1, 1939.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

‡ Since January 1, 1940, figures for London (b) have been for deaths from all forms of penumonia ; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

§ Death from puerperal sepsis.

EPIDEMIOLOGICAL NOTES

Measles

Measles is at present by far the most prevalent infectious disease, affecting every one of the sixty-one administrative health areas in England and Wales. Although densely populated industrial areas are most involved, urban and rural districts have not escaped, and in some instances have suffered more heavily in relation to population than the large towns. In London increase in notifications in recent weeks suggests that the deferred epidemic is at hand. The disease is rife among children recently evacuated from Gibraltar, for whom treatment in hospital is usually found to be necessary. Counties heavily attacked are Lancaster 1,911 (Liverpool 305, Manchester 584, Salford 101, Southport 69); Yorks, West Riding, 991 (Bradford 90, Leeds 96, Sheffield 64, Selby U.D. 70, Castleford U.D. 52, Rotherham R.D. 49); Derby 530 (Derby 74, Glossop M.B. 54, Long Eaton U.D. 115, Ripley U.D. 66); Durham 423 (urban districts of Consett 61, Brandon and Byshottles 41, Stanley 75); Nottingham 332 (Nottingham 69, Beeston and Stapleford U.D. 45).

In Scotland measles has been diminishing in incidence over the last six months and is at present mainly confined to the large towns: Glasgow 151, Edinburgh 80, Greenock 52, Kirkcaldy 36, Port Glasgow 28, Dunfermline 22, Falkirk 14, Ayr and Paisley 9 each. The disease appears to be more severe in Scotland than in England and Wales.

Enteric Fever

The continued prevalence of enteric fever, notifications being nearly four times those for the same period last year, and the lack of success which has attended the efforts made by sanitary authorities to trace the source of the disease in many of the outbreaks call in question current methods of preparation, storage, and distribution of foodstuffs. Water does not appear to have been the vehicle in any of the outbreaks ; in most instances they have been small and localized and the infected article has become unavailable for examination before the nature of the disease has been determined.

Cases occurred in twenty-five administrative areas, but only in nine were more than 5 notified—namely: Northampton 33 (Northampton 2, urban districts of Wellingborough 13, Rushden 6, Burton Latimer 1, and the municipal boroughs of Kettering 10, Higham Ferrers 1); Lancaster 26 (Blackburn 1, Bolton 3, Liverpool 2, Manchester 7, Farnworth M.B. 8, urban districts of Littleborough, Newton-le-Willows, Westhoughton, municipal boroughs of Prestwich and Rawtenstall, 1 each); Warwick 18 (Birmingham 7, Coventry 6, municipal boroughs of Leamington 2, Sutton Coldfield 1, Warwick 1, and the urban district of Solihull 1); Devon 16 (Exeter 7, Dawlish U.D. 1, Newton Abbot U.D. 5, R.D. 1, Torquay M.B. 1, Totnes R.D. 1); Yorks, East Riding, 10 in Kingston-upon-Hull ; Surrey 8 (Croydon 1, Wimbledon M.B. 7); Chester 7 (Birkenhead, Stockport, Wallasey, urban districts of Cheadle and Gatley, Bowdon, and Winsford, and rural district of Northwich, all 1 each); London 6 (2 in St. Pancras, and 1 each in Bermondsey, Poplar, Shoreditch, and Westminster). In Scotland there were 3 cases of typhoid fever (Glasgow 2, Angus C. 1) and 19 of paratyphoid B (in the counties of Ayr 8, Roxburgh 2, East Lothian 2, Renfrew 1, Berwick 1, and in the burghs of Glasgow 3, Dundee and Edinburgh 1 each).

Acute Poliomyelitis

There has been an increase of 50% in the incidence of acute poliomyelitis compared with the previous week and with the corresponding week of last year. The present figure, however, is less than one-half the level of the epidemic year 1938, and the disease is less widely distributed. A third of the cases are confined to one county and nearly three-fourths have occurred in three counties—namely Yorks, West Riding, 12 (Harrogate M.B. 7, Knaresborough U.D. 2, and 1 each in the urban district of Otley and in the rural districts of Nidderdale and Wetherby); Lancaster 7 (Bootle, Liverpool, Darwen M.B., Fleetwood M.B., and the urban districts of Abram, Trawden, and Turton, all 1 each); Stafford 7 (Wolverhampton 5, Tipton M.B. and Biddulph U.D. 1 each); Glamorgan 3, in Cardiff ; Warwick 2, in Birmingham and Coventry ; London 2, in Lambeth and Woolwich ; and 1 each in Wallasey (Chester), Taunton R.D. (Somerset), and Newport (Monmouth). The four Scottish cases occurred in Glasgow and in the counties of Ayr, Lanark, and Stirling.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.
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TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London;* SECRETARY, *Medisecra Westcent, London.*
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QUERIES AND ANSWERS

Multiple Sebaceous Cysts

"C. L. H." asks if any reader can suggest a cause and a cure for the following condition. A woman patient of 65 has multiple sebaceous cysts on her scalp varying in size from a pea to a plum. Some contain the usual thick sebaceous material, others a clear watery fluid. They have only appeared during the last five years and are becoming more numerous every year. Her mother suffered in the same way after the age of 60. Can anything be done to prevent fresh cysts forming?

Unequal Pupils during Anaesthesia

Dr. JOHN GORDON (Loughton) writes: This week I had occasion to give an anaesthetic to a fit man for a laparotomy for abdominal exploration. When, by the respirations, I believed the patient to be fairly deep I looked at his pupils and found that the right one was large, as I had imagined it would be, but the left was small. During the operation this state was present all the time, but when I saw the patient two hours afterwards the pupils were again equal. I was wondering if any of your readers would have any explanation for such a phenomenon.

Defect of Micturition

Dr. W. M. M. JACKSON writes: In reference to the query of "Puzzled" (August 31, p. 306), the condition referred to is unusual in a man of that age, and is often associated with enlargement of the prostate gland. If a cure cannot be found I suggest that the man make use of a small linen bag suspended by tapes from the waist by a narrow cotton belt. This bag should hold a wad of absorbent cotton which can be changed every day. This contrivance is readily adjusted, and easily made by anyone who can sew; the cost is negligible. Two or three extra bags should be available for washing purposes. Into this receptacle the penis should be placed after micturition, thus obviating any soiling of the clothing.

Hairy Legs in a Girl

Dr. F. S. AIREY (Leicester) writes in answer to "Civic" (August 10, p. 212): In the present state of our knowledge there is no satisfactory remedy for unwanted hair on the legs. That it is a common and distressing complaint, difficult of solution, is shown by the great variety of methods advocated and advertised. However, there are several methods of treatment worth mentioning. (1) Wax depilatories are in common use. Wax is spread on cloth, warmed, and laid on the part. When cold the dressing is torn off and the hair comes with it. This uncomfortable procedure calls for a repetition every month or so, and does not deter regrowth. (2) Barium sulphide and similar depilatories are also suitable. There are many proprietary remedies on the market which are reliable, but continued use may irritate the skin. (3) Shaving, in one form or another, is not a new remedy, but appears to be the best. A safety razor also shaves the skin itself and leaves it shiny. It is best to give an initial shave by this means and follow on with another method. Electric razors do not cut long hairs easily, but will keep down the growth without irritating the skin surface. So also will mechanical razors of the "viceroy" type. It is necessary to point out that such treatment must be carried out daily—not just once a week—or the stubble will be clearly evident. There is no scientific justification for the widespread impression that shaving encourages the growth of hair, but casual shaving will give this appearance, for the cut end of a hair will remain blunt and is more conspicuous than the normal tapering point. (4) There is a good proprietary abrasive (Bellin's "wonderstoen," 1123, Broadway, New York City) designed for use on the legs. It is stocked by some pharmacists. A disk is worked over the part and keeps the hair short. Because *x*-ray treatment is given for certain dermatological epilations there is an impression that it is a specific for all forms of unwanted hair. Few dermatologists or radiologists would countenance its use for such purposes. It should be mentioned only to be condemned, for a dose necessary to destroy the hair papillae will also be lethal to the adjacent skin. Telangiectasis, atrophy, and the other ill effects may not be shown for some years, but they are inevitable. The result is tragic whether the requisite dose be given on one occasion or divided at intervals determined by the patient. *X*-ray epilation may be used as a preliminary to other methods, but it has the disadvantage of introducing the patient to a form of treatment she must never have again, or have only after careful consideration on a limited number of occasions. Finding it effective and superior to other methods there are many women who will ask for more. If the physician refuses some will go elsewhere, and may even hide the fact that *x*-ray treatment has been given previously. For there are some women who will go to any length to get what they want in this respect, and there must be unscrupulous people about who will give it. There are also some inside the profession who are unaware of the dangers, and, unwittingly, initiate *x*-ray addiction.

Income Tax

Purchase of Property: Arrears of Property Tax

"P." completed purchase of a house in March, 1939. His solicitor had obtained a certificate that the property was free of unpaid taxes and encumbrances, but in November, 1939, additional assessments for the years 1937–8 and 1938–9 were made, and "P" is now being pressed for payment of about £20.

*** Rule 3 of No. VII, Schedule A, of the Income Tax Act of 1918 provides that "the tax on each assessment shall be levied on the occupier for the time being . . . notwithstanding any change of occupation." (There are two exceptions to the rule, but as the property was let before purchase by "P." they are irrelevant.) The legal position is that "P." is liable to pay the tax but has a right of recovery against the vendor. In the circumstances this involves hardship on the purchaser (the vendor being financially in low water), and some explanation is due to him as to why the liabilities for 1937–8 and 1938–9 were dealt with so late that he could not have been aware of them in time to protect himself when closing the transaction. It might be worth while putting the facts before the Board of Inland Revenue and asking for special consideration.

LETTERS, NOTES, ETC.

Removing Plaster Casts

Dr. T. W. BURGESS (Denman, New South Wales) writes: An article published by Dr. Reginald G. Bickford on removing plaster casts (*Journal*, March 30) prompts me to publish a simple method, especially when using "cellona" bandages. If the whole plaster is soaked in warm water for ten to fifteen minutes, or longer if very thick, the bandage can then be easily unwound. The main drawback to this method is of course the destruction of the plaster for further use.

Chemoprophylaxis of Rheumatic Fever

Dr. W. R. THROWER writes: The last sentence of your annotation (August 17, p. 232) on the above subject should have been printed in letters of fire. If there is one lesson to be learnt from the clinical use of sulphonamides it is the futility and risk of using them in infections by micro-organisms other than those upon which their activity is likely. That certain children could withstand the ill effects of prolonged dosage with sulphanilamide is not surprising, for it is well known that their toleration of sulphonamides generally is greater than that of adults; in any case, however, 10% of the treated cases had to be transferred to the control group because of intolerance.

Glasgow Branch of Socialist Medical Association

Dr. R. LIVINGSTONE writes from 15, Queen Mary Avenue, Glasgow, S.2: I should like to bring to the notice of your readers the fact that there is being formed in Glasgow a branch of the Socialist Medical Association. Membership is open to all medical personnel, including doctors, dentists, students, nurses, and pharmacists. The inaugural meeting is being held on Sunday, September 8, at 7 p.m., at 25, Burnbank Gardens, N.W. Any of your readers interested are invited to attend.

Corrigendum

Dr. E. G. L. GOFFE points out that an error—an important one—occurred in his letter on the injection treatment of muscular rheumatism (August 31, p. 200). "Two or three 5 c.cm. ampoules of quinine," there appearing, should have read: "Two or three 5 c.cm. ampoules of *quinine urea*."